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Announcements & Index

26 December 17, 1982

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Announcements & Index

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NATIONAL TECHNICAL INFORMATION SERVICE

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GOVERNMENT REPORTS

Announcements & Index

Volume 82, Number 26 December 17, 1982

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* Committee on Scientific and Technical Information

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Subcategories: Astronomy; Astrophysics; Celestial Mechanics.

Category 4. Atmoshpheric Sciences

Subcategories: Atmospheric Physics; Meteorology.

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Category 6. Biological and Medical Sciences

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Subcategories: Mathematics and Statistics; Operations Research.

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The full bibliographic report entries in this section are arranged by subject category and subcategory. Within each subcategory the reports are arranged alphanumerically by NTIS order number; the Ebcdic character set sort is used.

SAMPLE ENTRY

Field 12—MATHEMATICAL SCIENCES
Group 12A—Mathematics and Statistics
PB80-104045 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Constructed Facilities Div.
Computation of Hankel Transforms Using the Fast-Fourier Transform Algorithm,
E. Kausel, and G. Bouckovalas. Aug 79, 49p
R79-12, NSF/RA-79-12, NSF/RA-790206
Grant NSF-ENV77-18339

An efficient numerical procedure is presented for the computation of Hankel Transforms. The algorithm is based on the expression of the Hankel Transform in terms of a two-dimensional Fourier Transform, which is then reduced to only one dimension. The latter is then evaluated with the Fast Fourier Transform algorithm. Examples are presented, and a listing of the computer program included.

NTIS Subject Category
NTIS Subcategory
NTIS order number Availability/Price codes
Corporate or Performing Organization

Report title

Personal authors Report date Page count
Report number(s)
Contract or grant number(s)

Abstract

1. AERONAUTICS

1A. Aerodynamics

AD-A118 446/4 PC **A05**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mathematics.
Hereditary Models for Airfoils in Unsteady Aerodynamics, Numerical Approximations and Parameter Estimation.
Final rept. 15 Dec 79-15 Mar 81,
John A. Burns, and Eugene M. Cliff. Feb 82, 82p
VPI-E-81-18, AFWAL-TR-81-3173
Grant AFOSR-80-0068

This report is concerned with the development of a general mathematical model for the motion of a two-dimensional airfoil in unsteady aerodynamics and with the study of numerical schemes for estimating parameters in this model. The equations of motion are a set of coupled ordinary and functional differential equations. Approximating Wagner functions are used to construct state space models that retain the hereditary nature of unsteady fluid flow. The results of some simple numerical experiments are presented including a preliminary analysis of wind-tunnel data. (Author)

AD-A118 591/7 PC **A04**/MF **A01**
South Carolina Univ., Columbia. Coll. of Engineering.
Unsteady Boundary Layer Due to an Oscillating Free Stream vs. an Oscillating Model.
Final rept. 15 May 80-14 May 81,
Dennis E. Wilson. 25 Jun 82, 59p AFOSR-TR-82-0675
Grant AFOSR-80-0182

The objective of this investigation is to calculate the unsteady boundary layer induced on a thin airfoil by two distinct mechanisms. First, a uniform upstream flow approaches an airfoil which is undergoing a periodic transverse oscillation of specified frequency and amplitude with respect to the wind tunnel. And secondly, a uniform upstream flow approaches the same airfoil which is fixed with respect to the wind tunnel but is now subjected to transverse oscillating flow. The

transverse flow is produced at the walls of the wind tunnel test section and will contain a spatial distribution at the test section centerline. The method employed in this analysis uses the classical potential flow/boundary layer interaction. The mathematical model assumes a laminar incompressible flow over a two-dimensional thin airfoil. In addition, the amplitude of the transverse oscillation is assumed to be small with respect to the chord of the airfoil. This restriction is also equivalent to small transverse velocities relative to the upstream flow, if the frequencies are moderate. This assumption produces a set of linear disturbance equations for the unsteady flow. No other restrictions are placed upon the spatial distribution of the transverse flow, although results are presented only for cosine distribution which represents the worst possible case. (Author)

AD-A118 756/6 PC **A06**/MF **A01**
Air Force Academy, CO.
Measurement of Wake Interactions of a Canard and a Forward Swept Wing.
Technical note,
K. E. Griffin. 6 Jul 82, 101p Rept no. USAFA-TN-82-4

Experimental lifting surface wake data were taken from a canard/forward-swept wing reflecting plane wind tunnel model. The data include distributions of total, dynamic, and static pressures as well as cross velocity magnitudes and directions for an array of points around the model, both near the model and in its freestream wake. The model was tested as a body alone, as a wing/body combination, and as a wing/body/canard combination in order to compare wing wakes to wing/canard wakes.

N82-29263/2 PC **A02**/MF **A01**
Aeronautical Research Inst. of Sweden, Stockholm.
On Embedded Flow Characteristics of Sharp Edged Rectangular Wings.
E. S. Larson. 21 Apr 82, 19p LOG-C4712
Backup Document for Aiaa Synoptic Scheduled for Publication in the Journal of Aircraft, Feb. Or Mar. 1983.

The semiempirical, analytic expressions for steady, symmetric flow characteristics on thin rectangular wings at transonic speed are investigated. Semiempirical expressions representing aerodynamic characteristics of sharp edged rectangular wings are reported. The basic coefficients correlated very well with panel method results for Mach number of the free stream or = 1, the intended domain of applicability.

N82-29264/0 PC **A04**/MF **A01**
National Research Council of Canada, Ottawa (Ontario).
Boundary Layer Development on Perforated Walls in Transonic Wind Tunnels.
Y. Y. Chan. 8 Feb 80, 52p LTR-HA-47

The boundary layer development on the perforated walls of a transonic wind tunnel was studied experimentally. The measurements were made under real model testing conditions to provide a better understanding of the flow, so that a proper boundary condition for wall interference calculations could be formulated. The experimental results show that the boundary layer displacement effect is minimal for the lower wall but for the upper wall the normal velocity induced can be about three times greater than that at the wall. The wall characteristics are strongly modulated by the growth rate of the boundary layer. It also shows that the linear boundary condition used in the wall interference calculations does not adequately reproduce the nonlinear development of the flow at the wall.

N82-29267/3 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Aerodynamics of an Airfoil with a Jet Issuing from its Surface.
D. A. Tavella, and K. Karamcheti. May 82, 93p
NASA-TM-84825, NAS 1.15:84825
Contract NCC2-74

A simple, two dimensional, incompressible and inviscid model for the problem posed by a two dimensional wing with a jet issuing from its lower surface is considered and a parametric analysis is carried out to observe how the aerodynamic characteristics depend on the different parameters. The mathematical problem constitutes a boundary value problem where the position of part of the boundary is not known a priori. A nonlinear optimization approach was used to solve the problem, and the analysis reveals interesting characteristics that may help to better understand the physics involved in more complex situations in connection with high lift systems.

N82-29271/5 PC **A15**/MF **A01**
Boeing Vertol Co., Philadelphia, PA.
Investigation of a Rotor System Incorporating a Constant Lift Tip.
Final Contractor Report.
M. A. Mcveigh, H. Rosenstein, K. Bartie, and F. J. Mchugh. Oct 81, 326p NASA-CR-166261, NAS 1.26:166261
Contract NAS2-10769

A wind tunnel test of a 16.8 ft. model of a rotor having passively controlled pivotable tips is described. Performance and vibratory hub load data are presented which compare the performance of the rotor with the tips free and fixed. A brief analysis of the experimental findings is included.

PB82-875899 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Air Foils: Drag, Turbulent Flow, and Vibration Reduction. 1973-September, 1982 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for 1973-Sep 82.
Sep 82, 209p
Supersedes PB82-853391.Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the design of airfoils for the minimization of drag and turbulent flow. Topics include parameters affecting the formation of vortices, excessive vibration, and fuel consumption. (This updated bibliography contains 252 citations, 46 of which are new entries to the previous edition.)

1B. Aeronautics

AD-A118 692/3 PC **A07**/MF **A01**
Federal Aviation Administration, Washington, DC. Office of Aviation Safety.
Summary of Federal Aviation Administration Responses to National Transportation Safety Board Safety Recommendations.
Quarterly rept. Jan-Mar 82,
J. H. MacKinnon, and C. A. Carpenter. Jan 82, 148p
Rept no. FAA-ASF-300-82-2
Includes errata sheet dated 24 Aug 82.

This report contains NTSB (National Transportation Safety Board) recommendations and all FAA (Federal Aviation Administration) responses to Board recommendations that were delivered to the Board during the applicable quarter. In addition, the report includes NTSB requests and FAA responses concerning reconsiderations, status reports, and followup actions.

N82-29288/9 PC **A08**/MF **A01**
Princeton Univ., NJ. Flight Research Lab.
Development of Flying Qualities Criteria for Single Pilot Instrument Flight Operations.
Interim Report, Sep. 1979 - May 1981.
A. Bar-gill, W. B. Nixon, and G. E. Miller. Jun 82, 167p NASA-CR-165932, NAS 1.26:165932
Contract NAS1-15764

Flying qualities criteria for Single Pilot Instrument Flight Rule (SPIFR) operations were investigated. The ARA aircraft was modified and adapted for SPIFR operations. Aircraft configurations to be flight-tested were chosen and matched on the ARA in-flight simulator, implementing modern control theory algorithms. Mission planning and experimental matrix design were completed. Microprocessor software for the onboard data acquisition system was debugged and flight-tested. Flight-path reconstruction procedure and the associated FORTRAN program were developed. Algorithms associated with the statistical analysis of flight test results and the SPIFR flying qualities criteria deduction are discussed.

PB82-910407 PC**$5.00**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Aircraft Accident Report - Pilgrim Airlines Flight 458 deHavilland DHC-6-100, N127PM Near Providence, Rhode Island, February 21, 1982.
20 Jul 82, 30p NTSB-AAR-82-7
Paper copy also available on subscription, North American Continent price $50.00/year; all others write for quote.

On February 21, 1982, at 1533 e.s.t., Pilgrim Airlines flight 458, a scheduled commuter passenger flight, made an emergency landing on the northwest branch of the Scituate Reservoir near Providence, Rhode Island, after a fire erupted in the cockpit while the aircraft was en route under instrument conditions between Groton, Connecticut, and Boston, Massachusetts, at 4,000 feet. The fire, which spread from the cockpit to the cabin in flight, destroyed the aircraft after impact. The captain and first officer were seriously injured. One passenger was killed, eight passengers had serious injuries, and one passenger sustained minor injuries. The National Transportation Safety Board determines that the probable cause of the accident was the deficient design of the isopropyl alcohol windshield washer/deicer system and the inadequate maintenance of the system which resulted in an in-flight fire. The ignition source of the fire was not determined.

PB82-916910 PC **A13**/MF **A01**
National Transportation Safety Board, Washington, DC.
Aircraft Accident Reports - Brief Format, U.S. Civil Aviation, Issue Number 6 - 1981 Accidents.
14 Jul 82, 297p NTSB-BA-82-8
Paper copy also available on subscription, North American Continent price $130.00/year; all others write for quote.

The publication contains selected aircraft accident reports, in brief format, occurring in U.S. civil aviation operations during calendar year 1981. The 299 General Aviation accidents contained in this publication represent a random selection. The publication is issued irregularly, normally fifteen times each year. The brief format presents the facts, conditions, circumstances, and probable cause(s) for each accident. Additional statistical information is tabulated by injury index, injuries, and causal factors.

1C. Aircraft

AD-A118 490/2 PC **A09**/MF **A01**
Army Aviation Engineering Flight Activity, Edwards AFB, CA.
Airworthiness and Flight Characteristics Test. Part I. YAH-64 Advanced Attack Helicopter.
Final rept. 30 May-17 Jul 81,
Gary L. Bender, Larry B. Higgins, Richard Savage, John D. Ottomeyer, and Bartholomew D. Picasso, III . Sep 81, 181p Rept no. USAAEFA-80-17-1

The Airworthiness and Flight Characteristics Test Part 1 of the prototype YAH-64 helicopter (S/N 77-23258) was conducted at three test sites; Palomar Airport, Carlsbad, California (elevation 328 ft). Bishop Airport, Bishop, California (elevation 4120 ft), and Coyote Flats, California (elevation 9980 ft). Approximately 32 productive hours were flown during 45 flights between 30 May and 17 July 1981. Several design changes affecting performance and handling qualities were made to the YAH-64 since the last evaluation (EDT 4) the most significant of which were the changes in tail rotor rigging, the addition of a third DC electrical bus and the incorporation of a Nap-of-the-Earth/Approach mode of operation for the horizontal stabilator. Level flight performances and vibration levels have been slightly degraded since EDT 4, while handling qualities and out-of-ground-effect hover performance remain essentially the same. Numerous anomalies in the operation of the Digital Automatic Stabilization Equipment (DASE) were experienced which may render some of the handling qualities test results suspect. Two deficiencies (both DASE related) were found during this evaluation. Yaw SAS hardovers, and disengagement

of the DASE with failure of the No.2 generator. Nine previously unreported shortcomings (4 DASE related) were found. (Author)

AD-A118 514/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
A Helicopter Handling-Qualities Study of the Effects of Engine Response Characteristics, Height-Control Dynamics, and Excess Power on Nap-of-the-Earth Operations,
Lloyd D. Corliss. Apr 82, 12p
Presented at the AHS/NASA Specialists' Meeting (38th) on Helicopter Handling Qualities, Palo Alto, CA.

A ground-based simulation study was conducted on a large-scale motion simulator to study the effects in the vertical axis of engine response characteristics on handling qualities for a nap-of-the-earth (NOE) operating environment. This study concentrated specifically on the helicopter configuration with an rpm-governed gas-turbine engine and expands previous work by focusing on aspects peculiar to rotary-wing and NOE operations. A wide range of engine response time, vehicle damping and sensitivity, and excess power levels was studied. The data are compared with the existing handling-qualities specifications, MIL-F-83300 and AGARD 577, and in general show a need for higher minimums when performing such NOE maneuvers as a dolphin and bob-up task. (Author)

AD-A118 527/1 PC **A02**/MF **A01**
Tactical Air Command, Langley AFB, VA.
F-106 Tow System (IOT&E).
Draft Test Plan.
Apr 82, 6p

The impending deactivation of the F-101 fleet at Tyndall AFB will require an alternate means of providing gun tow target capability at the USAFADWC. The tow capabilities of the F-106 should be investigated as a method of meeting these requirements. The RM-60 tow system was originally considered for use on the F-106. The RM-60 is a two-way tow system developed to support the target requirements of the US Army Division Air Defense System (DIVADS) program. It has been tested by the New Mexico Air National Guard (NMANG) and found to be compatible with the A-7D aircraft. In the current configuration; however, the RM-60 is not compatible with F-106 aircraft pylon. The development of a smaller, improved version of the RM-60, designated the RM-30, may solve the F-106 compatibility problems. Additionally, current assets of the A/A 37U-15 (DART) tow reels may be useful in providing an interim tow capability for F-106 aircraft. Both the RM-30 and A/A 37U-15 tow reels can carry and tow the Low Cost Tow Target (LCTT) to fulfill the gun tow target requirement at the USAFADWC. (Author)

AD-A118 567/7 PC **A03**/MF **A01**
Comarco, Inc., Anahiem, CA.
Computer Aided Mission Planning System (CAMPS).
Final technical rept. 1 Jul 79-1 Oct 81,
D. Bailey, D. Frye, and W. Woodbury. Jun 82, 50p
RADC-TR-82-148
Contract F30602-79-C-0230

Algorithms and computer programs were developed to automate a wing/squadron level capability for flight planning and penetration analysis for the F-4E and F-111F; and weapons planning for the F-4E with a limited set of weapons and release conditions. (Author)

AD-A118 571/9 PC **A12**/MF **A01**
Federal Aviation Administration, Washington, DC. Office of Management Systems.
Census of U.S. Civil Aircraft, Calendar Year 1981.
Annual rept.,
31 Dec 81, 252p
See also AD-A106 675.

Same as AD-A106 675.

AD-A118 596/6 PC **A14**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Criteria for Handling Qualities of Military Aircraft.
Conference proceedings.
Jun 82, 320p Rept no. AGARD-CP-333
Presented at The Flight Mechanics Panel Symposium on Criteria for Handling Qualities of Military Aircraft held in Fort Worth, US, 19-22 Apr 82.

These Proceedings consist of the papers presented at the AGARD Flight Mechanics Panel Symposium on Criteria for Handling Qualities of Military Aircraft held in Fort Worth, US, 19-22 April 1982. Topics covered include: present status of criteria, gains achieved in the Seventies and future prospects, criteria for flight at high angle of attack, special problems and techniques for handling qualities determination. (Author)

AD-A118 609/7 PC **A08**/MF **A01**
Princeton Univ., NJ. Dept. of Mechanical and Aerospace Engineering.
Rotor Aerodynamics in Ground Effect at Low Advance Ratios.
Final rept. 10 Sep 78-28 Feb 82,
H. C. Curtiss, Jr., W. F. Putman, and E. J. Hanker, Jr.
27 Jul 82, 163p MAE-1571, ARO-16061.2-EG
Contract DAAG29-80-K-0093, Grant DAAG29-78-G-0194

The results of an experimental study of the aerodynamic characteristics of a helicopter rotor operating in ground effect at low advance ratios are presented. Flow visualization studies were conducted along with measurement of the forces and moments acting on the rotor as a function of advance ratio, height above ground and collective pitch. Steady state experiments as well as non-steady experiments involving translational acceleration were conducted. Three distinct flow regimes were noted from the flow visualization studies. At the low end of the advance ratio range a recirculating flow was present, at intermediate advance ratios a horseshoe shaped vorted formed under the rotor, and at the high end of the advance ratio range studied, the rotor wake flows entirely downstream. At test conditions were the recirculating flow or ground vortex is present there are marked departures from classical ground effect theory. Translational acceleration was found to have a significant effect on the rotor forces and moments indicating that some appreciable time is required for the establishment of the ground effect flow field when a recirculating flow or ground vortex exists in the steady state. The results indicate that magnitude of the ground effects experienced by a helicopter are sensitive to the flight path of the helicopter. (Author)

AD-A118 761/6 PC **A02**/MF **A01**
American Helicopter Society, Inc., Washington, DC.
A Note on the General Scaling of Helicopter Blade-Vortex Interaction Noise,
F. H. Schmitz, D. A. Boxwell, S. Lewy, and C. Dahan.
May 82, 14p
Presented at the Annual Forum of the American Helicopter Society (38th), Anaheim, CA.

A model-rotor acoustic experiment in a three meter open section anechoic wind tunnel (CEPRA-19) is described. The important scaling parameters are reviewed and some on-line acoustic data are presented for conditions known to produce blade-vortex interaction noise on a single rotor helicopter. Time averages of the model-scale acoustic pulses are compared with similar full-scale data taken in-flight under the same non-dimensionalized conditions. Good general agreement between model and full-scale pulse shapes and amplitudes of blade-vortex interaction noise is shown for one advance ratio over a range of inflow conditions for the rotor. Directivity sweeps for a condition known to generate blade-vortex interactions are presented. Some model rotor testing limitations of the CEPRA-19 facility in its present configuration are indicated. (Author)

AD-A118 768/1 PC **A11**/MF **A01**
Northrop Corp., Hawthorne, CA. Aircraft Div.
Evaluation of a Damage Accumulation Monitoring System as an Individual Aircraft Tracking Concept.
Final rept. 14 Nov 80-30 Sep 81,
C. L. Guadagnino. May 82, 233p NOR-82-58,
AFWAL-TR-82-3023
Contract F33615-81-C-3204

The objective of this program was to study and evaluate the concept of using a damage accumulation monitoring system based on microprocessor technology for individual aircraft tracking (IAT) needed to satisfy the Force Management requirements of MIL-STD-1503A. The two major components of this study were: (1) the evaluation of selected output and input IAT parameters required to monitor the potential crack growth of each of two major classes of aircraft (Bomber/Transport and Fighter/Attack/Trainer aircraft), and (2) the definition of the microprocessor-based IAT system in terms of capabilities and requirements. A number of existing and planned IAT programs which were considered as typical for the two major classes of aircraft were studied to determine problem areas, to evolve advanced concepts, and to evaluate the output/input parametric requirements and the functional characteristics needed to satisfy IAT system goals. Several conceptual microprocessor based IAT systems and one existing microprocessor based IAT system capable of satisfying the requisite functional requirements were developed, studied, and described. In addition, the study was extended to examine the capability of microprocessor based IAT systems to satisfy in part or wholly, the load and environment spectra survey (L/ESS) functions. Several system concepts were developed and described. (Author)

AD-A118 770/7 PC **A06**/MF **A01**
Tufts Univ., Medford, MA. Dept. of Electrical Engineering.
Pointing Payload for Single Tether Balloons,
Alvin H. Howell. 26 Feb 82, 106p SCIENTIFIC-1, AFGL-TR-82-0076
Contract F19628-80-C-0060

A general purpose, two-axis, pointing-type payload has been built for use in the tethered balloon program at Holloman AFB. It is capable of carrying an experiment having directional requirements, and weighing up to 100 pounds. When attached to the flying lines of an aerodynamically shaped balloon and held by a single tether, it will keep an axis within the payload pointed toward a target light on the ground in a daylight operation with a precision of + or - 0.75 degrees when elevated to 10,000 feet. Three modes of operation are possible, namely a stare mode, a search mode, and a pointing mode. In the stare mode the payload heading is set by commands from the ground, and the search feature permits an area surrounding the stare position to be scanned as a means of finding the target light. When the tracker finds the target the pointing axis in the payload will be continuously directed toward that target. Features were included which allow the payload to be readily carried on the tines of a forklift during the launch operation. Only a single additional step is needed in the regularly used launch procedure, that being to arrest the let-up, anchor the system in a particular way, insert the payload, and continue the let-up in the normal way. Capability of the system was demonstrated in a successful test at Holloman in September 1981 while carrying a hitchhike experiment that measured IR transmissions through the atmosphere. (Author)

AD-A118 773/1 PC **A99**/MF **A01**
Air Force Aerospace Medical Research Lab., Wright-Patterson AFB, OH.
USAF Bioenvironmental Noise Data Handbook. Volume 172. Hush-House Noise Suppressor (Aero Systems Engineering, Inc.) Far-Field Noise.
Technical rept.,
Robert A. Lee, Thomas H. Rau, and Carolyn Jones.
Jul 82, 823p Rept no. AMRL-TR-75-50-VOL-172
See also Volume 168, AD-A116 153.

The hush-house noise suppressor was made by Aero Systems Engineering of Texas, Inc. for acoustical suppression of various AF fighter/trainer aircraft during ground runup operations. This report provides measured and extrapolated data defining the bioacoustic environments produced by several aircraft/engines operating in the hush-house suppressor for various engine power configurations. Far-field data measured at 20 locations are normalized to standard meteorological conditions and extrapolated from 75-8000 meters to derive sets of equal-value contours for seven acoustic measures as function of angle and distance from the source. Refer to Volume 1 of this handbook, 'USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application,' AMRL-TR-75(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Data are presented for the following aircraft/engines operating in the hush-house noise suppressor: F-4, F-15, F-16, F-105, F-106, F-111F and T-38 aircraft and the TF41-A-1, J79-GE-15, F100-PW-100, J75-P19, J-75-P-17 and TF30-P-100 engines. (Author)

AD-A118 796/2 PC **A03**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
Operational Noise Data for UH-60A and CH-47C Army Helicopters.
Final rept.,

P. D. Schomer, Aaron Averbuch, and Richard Raspet. Jun 82, 46p Rept no. CERL-TR-N-131

The objectives of this study were to develop sound exposure level (SEL) versus distance curves for the UH-60A and CH-47C Army helicopters, to investigate the variation of SEL with aircraft speed, and to confirm the validity of the measurement procedures by comparing data obtained for UH-1H helicopters at Forts Campbell and Rucker. Sound levels produced by the helicopters were measured for heavily and lightly loaded aircraft which were hovering and traveling at various speeds and distances. The data show that a heavily loaded UH-60A is about 2 dB louder than a lightly loaded one. Landing noise with the UH-60A and CH-47 is substantially greater than for level flyover. The variation of SEL with speed is rather modest, except for aircraft at very low or very high speeds. The results for the UH-1H at Forts Campbell and Rucker did not compare as favorably as expected. Various factors, including maintenance procedures and the surface of the test area, may have contributed to the discrepancies. (Author)

AD-A118 827/5 PC **A04**/MF **A01**
Bell Helicopter Textron, Fort Worth, TX.
Slack Wire Strike Protection Concepts.
Final rept. Sep 81-May 82.
Jul 82, 72p USAAVRADCOM-TR-82-D-9
Contract DAAK51-81-C-0034

A design study has been conducted to establish slack wire strike protection concepts. The objective of the study was to define and investigate design concepts that could prevent helicopter mishaps caused by main and tail rotor controls entanglement with a slack wire. The study helicopter was an OH-58A equipped with a taut wire strike protection system (WSPS). (Author)

AD-A118 856/4 PC **A10**/MF **A01**
Rockwell International, Los Angeles, CA. North American Aircraft Operations.
Improved Methods for Predicting Spectrum Loading Effects. Volume I. Technical Summary.
Final rept. 16 Jan 79-30 Nov 81,
James B. Chang, R. M. Hiyama, and M. Szamossi. Nov 81, 217p NA-81-234-VOL-1, AFWAL-TR-81-3092-VOL-1
Contract F33615-77-C-3121
See also Volume 2, AD-A118 857.

This report presents the technical details of improved methods for predicting the load interaction effects on crack growth under flight spectrum loading developed in a research effort sponsored by the USAF. These include the cycle-by-cycle crack-growth prediction method used in the detail design stage, the flight-by-flight crack-growth analysis method for individual aircraft tracking usage, and preliminary design trade-off studies. Results of the experimental verification program are also presented in this document. (Author)

AD-A118 857/2 PC **A11**/MF **A01**
Rockwell International, Los Angeles, CA. North American Aircraft Operations.
Improved Methods for Predicting Spectrum Loading Effects. Volume II. Test Data.
Final rept. 16 Jan 79-30 Nov 81,
James B. Chang, and Ko Wei Liu. Nov 81, 249p NA-81-234-VOL-2, AFWAL-TR-81-3092-VOL-2
Contract F33615-77-C-3121
See also Volume 1, AD-A118 856.

This report presents the random flight spectra crack-growth test data generated in the experimental verification program of a research effort which aimed to upgrade the crack-growth prediction technology required for implementation of the damage-tolerance control procedure throughout the life cycle of any weapon system. Fighter and transport baseline spectra used in the test program are also presented in this report. The objective of phase III of this program is to perform experimental testing in verifying the crack-growth methodology developed in phases I and II. This volume contains tabulations and plots of test data generated during this experimental program. Data tabulations are presented for 41 random flight spectrum tests, including the fighter baseline spectrum tests, the fighter spectrum variation tests, and mission mix tests, as well as a transport baseline spectrum and its variation tests. In this volume, random flight spectrum tables used for the baseline tests and the mission mix tests are included. All test spectra used in the spectrum variation tests are not presented in this report, since they can easily be reconstructed from the baseline spectra.

AD-A118 858/0 PC **A07**/MF **A01**
Dayton Univ., OH. Research Inst.
Force Management Methods Task II. Volume I. Summary and Analysis Considerations.
Interim rept. Oct 78-Jul 80,
Alan P. Berens. Nov 80, 131p AFWAL-TR-80-3120-VOL-1
Contract F33615-77-C-3122
See also Volume 2, AD-A118 859.

A state-of-the-art survey was conducted as the initial phase of the preparation of a handbook of methods for accomplishing the force management task imposed by MIL-STD-1530A. TASK II was devoted to the development of improved methods for performing Force Management with special emphasis on the use of mechanical strain recorders, microprocessors, and crack growth gages as data recording devices. This report summarizes the University of Dayton's effort on general analysis of Force Management data. An error analysis model is defined in terms of time to a critical crack length. Various aircraft tracking systems are compared. (Author)

AD-A118 859/8 PC **A11**/MF **A01**
Dayton Univ., OH. Research Inst.
Force Management Methods Task II. Volume II. Transport/Bomber Aircraft - Evaluation of Potential Improved Methods.
Interim rept. Oct 78-Jul 80,
D. S. Morcock, K. E. Brown, J. C. Davis, and R. L. Johnson. Nov 80, 231p AFWAL-TR-80-3120-VOL-2
Contract F33615-77-C-3122
Prepared in cooperation with Lockheed-Georgia Co. Marietta.

This report presents an evaluation of candidates for potentially improving Force Management methods for transport/bomber aircraft. Using the C-141A transport as a baseline, an analytical and conceptual evaluation was performed to assess the applicability of crack growth gages, mechanical strain recorders and microprocessors in Force Management for large flexible aircraft. (Author)

AD-A118 860/6 PC **A08**/MF **A01**
Dayton Univ., OH. Research Inst.
Force Management Methods Task II. Volume III. Attack/Fighter/Trainer Aircraft Evaluation of Potential Improved Methods.
Interim rept. Oct 78-Jul 80,
C. E. Larson, and D. J. White. Nov 80, 157p AFWAL-TR-80-3120-VOL-3
Contract F33615-77-C-3122
Prepared in cooperation with Vought Corp. Dallas, TX.

This report presents an evaluation of candidates for potentially improving Force Management methods for attack/fighter/trainer aircraft. These potential methodologies have been ranked and graded according to cost, accuracy, ease of implementation and overall effectiveness. (Author)

N82-29268/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Aircraft Geometry Verification with Enhanced Computer Generated Displays.
J. V. Cozzolongo. Jun 82, 13p NASA-TM-84254, NAS 1.15:84254

A method for visual verification of aerodynamic geometries using computer generated, color shaded images is described. The mathematical models representing aircraft geometries are created for use in theoretical aerodynamic analyses and in computer aided manufacturing. The aerodynamic shapes are defined using parametric bi-cubic splined patches. This mathematical representation is then used as input to an algorithm that generates a color shaded image of the geometry. A discussion of the techniques used in the mathematical representation of the geometry and in the rendering of the color shaded display is presented. The results include examples of color shaded displays, which are contrasted with wire frame type displays. The examples also show the use of mapped surface pressures in terms of color shaded images of V/STOL fighter/attack aircraft and advanced turboprop aircraft.

N82-29312/7 PC **A04**/MF **A01**
Cincinnati Univ., OH. Dept. of Aerospace Engineering and Applied Mechanics.
Flap-Lag-Torsional Dynamics of Extensional and Inextensional Rotor Blades in Hover and in Forward Flight.
Semiannual Progress Report, Jan. - Jun. 1982.
C. Dasilva. Jun 82, 72p NASA-CR-169159, NAS 1.26:169159
Contract NAG2-38

The reduction of the O(cu epsilon) integro differential equations to ordinary differential equations using a set of orthogonal functions is described. Attention was focused on the hover flight condition. The set of Galerkin integrals that appear in the reduced equations was evaluated by making use of nonrotating beam modes. Although a large amount of computer time was needed to accomplish this task, the Galerkin integrals so evaluated were stored on tape on a permanent basis. Several of the coefficients were also obtained in closed form in order to check the accuracy of the numerical computations. The equilibrium solution to the set of 3n equations obtained was determined as the solution to a minimization problem.

N82-29313/5 PC **A15**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
The Feasibility of a High-Altitude Aircraft Platform with Consideration of Technological and Societal Constraints.
Thesis - Kansas Univ.
E. B. Graves. Jun 82, 250p NASA-TM-84508, NAS 1.15:84508

The feasibility of remotely piloted aircraft performing year around missions at an altitude of 70,000 feet is determined. Blimp and airplane type vehicles employing solar-voltaic, microwave, or nuclear propulsion systems were considered. A payload weighing 100 pounds and requiring 1000 watts of continuous power was assumed for analysis purposes. Results indicate that a solar powered aircraft requires more solar cell area than is available on conventional aircraft configurations if designed for the short days and high wind speeds associated with the winter season. A conventionally shaped blimp that uses solar power appears feasible if maximum airspeed is limited to about 100 ft/s. No viable airplane configuration that uses solar power and designed to withstand the winter environment was found. Both a conventionally shaped blimp and airplane appear feasible using microwave power. Nuclear powered aircraft of these type are also feasible. Societal attitudes toward the use of solar power in high altitude aircraft appear favorable. The use of microwave power for this purpose is controversial, even though the ground station required would transmit power at levels comparable to existing satellite communications stations.

N82-29315/0 PC **A18**/MF **A01**
Bell Helicopter Co., Fort Worth, TX.
Investigation of Correlation Between Full-Scale and Fifth-Scale Wind Tunnel Tests of a Bell Helicopter Textron Model 222.
Final Report.
P. K. Squires. Jun 82, 401p NASA-CR-166362, NAS 1.26:166362
Contract NAS2-10773

Reasons for lack of correlation between data from a fifth-scale wind tunnel test of the Bell Helicopter Textron Model 222 and a full-scale test of the model 222 prototype in the NASA Ames 40-by 80-foot tunnel were investigated. This investigation centered around a carefully designed fifth-scale wind tunnel test of an accurately contoured model of the Model 222 prototype mounted on a replica of the full-scale mounting system. The improvement in correlation for drag characteristics in pitch and yaw with the fifth-scale model mounted on the replica system is shown. Interference between the model and mounting system was identified as a significant effect and was concluded to be a primary cause of the lack of correlation in the earlier tests.

N82-29316/8 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Flight Transportation Lab.
The Cost of Noise Reduction for Departure and Arrival Operations of Commercial Tilt Rotor Aircraft.
H. B. Faulkner, and W. M. Swan. Jun 76, 118p NASA-CR-137803, NAS 1.26:137803
Contract NAS2-7620

The relationship between direct operating cost (DOC) and noise annoyance due to a departure and an arrival operation was developed for commercial tilt rotor aircraft. This was accomplished by generating a series of tilt rotor aircraft designs to meet various noise goals at minimum DOC. These vehicles ranged across the spectrum of possible noise levels from completely unconstrained to the quietest vehicles that could be designed within the study ground rules. Optimization parameters were varied to find the minimum DOC. This basic variation was then extended to different aircraft sizes and technology time frames.

N82-29317/6 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Automated Optimum Design of Wing Structures. Deterministic and Probabilistic Approaches.
S. S. Rao. Aug 82, 47p NASA-TM-84475, L-15169

The automated optimum design of airplane wing structures subjected to multiple behavior constraints is described. The structural mass of the wing is considered the objective function. The maximum stress, wing tip deflection, root angle of attack, and flutter velocity during the pull up maneuver (static load), the natural frequencies of the wing structure, and the stresses induced in the wing structure due to landing and gust loads are suitably constrained. Both deterministic and probabilistic approaches are used for finding the stresses induced in the airplane wing structure due to landing and gust loads. A wing design is represented by a uniform beam with a cross section in the form of a hollow symmetric double wedge. The airfoil thickness and chord length are the design variables, and a graphical procedure is used to find the optimum solutions. A supersonic wing design is represented by finite elements. The thicknesses of the skin and the web and the cross sectional areas of the flanges are the design variables, and nonlinear programming techniques are used to find the optimum solution.

N82-29329/1 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Agricultural Airplane Mission Time Structure Characteristics.
J. W. Jewel, Jr.. Jul 82, 44p NASA-TM-84470, L-15125

The time structure characteristics of agricultural airplane missions were studied by using records from NASA VGH flight recorders. Flight times varied from less than 3 minutes to more than 103 minutes. There was a significant reduction in turning time between spreading runs as pilot experience in the airplane type increased. Spreading runs accounted for only 25 to 29 percent of the flight time of an agricultural airplane. Lowering the longitudinal stick force appeared to reduce both the turning time between spreading runs and pilot fatigue at the end of a working day.

1D. Aircraft Flight Control and Instrumentation

AD-A118 604/8 PC **A11**/MF **A01**
Embry-Riddle Aeronautical Univ., Daytona Beach, FL.
Evaluating the Use of Electronic Flight Instrument Systems in General Aviation Aircraft.
Final rept.,
J. B. Shelnutt, J. M. Childs, W. W. Prophet, J. P. Smith, and B. Strauch. Jun 82, 231p DOT/FAA/CT-82/73, DOT/FAA/EM-82-14
Contract DOT-FA-79NA-6040
Prepared in cooperation with Seville Research Corp., Pensacola, FL. Rept. no. SEVILLE-TR-82-01.

Several avionics manufacturers have announced plans to produce electronic flight instrument systems (EFIS) for general aviation aircraft. In recognition of the need for information concerning the impact of these new systems on pilot performance, the FAA has initiated a two-phased research program devoted to planning and conducting exploratory evaluations that will assess the ability of general aviation pilots to operate EFIS-equipped aircraft. The results of the first phase of this project are presented in this report. The objectives of this phase were to determine the specific goals of the exploratory evaluations and to develop general guidance--i.e., a conceptual approach--for their conduct. The conceptual approach is described in terms of (1) the information needed from the planned evaluations, (2) the general design of the overall study, (3) requirements for the performance measurement systems that would be employed to collect data and for the analysis of that data, (4) requirements for test facilities and equipment, and (5) procedures for selecting and training evaluation subjects. While the conceptual approach that was developed is specific to the planned research, it is discussed and described in general terms to increase its utility as general guidance for planning evaluations of pilot performance. (Author)

N82-29958/7 PC **A07**/MF **A01**
General Research Corp., Santa Barbara, CA.
Automated Verification of Flight Software. User's Manual.
S. H. Saib. Apr 82, 143p NASA-CR-166346, NAS 1.26:166346
Contract NAS2-10550

(Automated Verification of Flight Software), a collection of tools for analyzing source programs written in FORTRAN and AED is documented. The quality and the reliability of flight software are improved by: (1) indented listings of source programs, (2) static analysis to detect inconsistencies in the use of variables and parameters, (3) automated documentation, (4) instrumentation of source code, (5) retesting guidance, (6) analysis of assertions, (7) symbolic execution, (8) generation of verification conditions, and (9) simplification of verification conditions. Use of AVFS in the verification of flight software is described.

N82-29969/4 PC **A11**/MF **A01**
SRI International, Menlo Park, CA.
Design Study of Software-Implemented Fault-Tolerance (Sift) Computer.
Final Report.
J. H. Wensley, J. Goldberg, M. W. Green, W. H. Kutz, and K. N. Levitt. Jun 82, 246p NASA-CR-3011, NAS 1.26:3011
Contract NAS1-13792

Software-implemented fault tolerant (SIFT) computer design for commercial aviation is reported. A SIFT design concept is addressed. Alternate strategies for physical implementation are considered. Hardware and software design correctness is addressed. System modeling and effectiveness evaluation are considered from a fault-tolerant point of view.

N82-30013/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Applications to Aeronautics of the Theory of Transformations of Nonlinear Systems.
G. Meyer, R. Su, and L. R. Hunt. May 82, 13p NASA-TM-84249, NAS 1.15:84249
Contract N00014-76-C-1136

The development of the transformation theory is discussed. Results and applications concerning the use of this design technique for automatic flight control of aircraft are presented. The theory examines the transformation of nonlinear systems to linear systems. The tracking of linear models by nonlinear plants is discussed. Results of manned simulation are also presented.

PB82-875451 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Multiplexing in Aircraft. June, 1974-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 74-Sep 82.
Sep 82, 129p
Supersedes PB80-850548.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the developing technology of multiplexing for military, commercial, and supersonic aircraft. The design and application of various multiplex systems are discussed including fiber optic serial data buses. Fiber optic buses offer increased bandwidth (higher data throughput), and immunity to electrical noise and nuclear electromagnetic pulse interference. (This updated bibliography contains 120 citations, 18 of which are new entries to the previous edition.)

1E. Air Facilities

AD-A118 610/5 PC **A04**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Civil Engineering.
Feasibility of Computing Residual Displacements in Runways and Crater Repairs.
Final rept.,
Lawrence C. Rude. Apr 82, 57p AFOSR-TR-82-0669
Grant AFOSR-81-0102

The purpose of this study was to determine the feasibility of computing residual displacements in runways and crater repairs under repeated aircraft loadings. This report presents a methodology for computing residual displacements that is economical and easy to use. It also contains a literature review and a presentation of a second procedure to compute residual displacements. Sample calculations were done to illustrate the first procedure and the results compared favorably with previously published test data. The limitations of the second procedure were also discussed. (Author)

AD-A118 828/3 PC **A08**/MF **A01**
H.H. Aerospace Design Co., Inc., Bedford, MA.
A Technical Analysis of Rehosting the National Airspace System Software.
Final rept. Nov 80-Aug 81,
K. Britting, A. Cocanower, A. Gupta, M. Hsu, and F. Marcus. Oct 81, 162p HHA-81-4, FAA-AP-82-2
Contract DT-FA01-80-Y-10595

The Federal Aviation Administration (FAA) is planning to replace within the next ten years the computers used to provide en route air traffic control services; in carrying out this replacement there are many different strategies the FAA could follow. The purpose of this report is to study the strategy known as rehosting the National Airspace System (NAS) software on instruction-compatible machines. The idea is that the current computers (and associated peripherals) would be replaced by modern hardware that executes the same machine-language instructions. The current NAS software would be changed only insofar as proves necessary for the software to run on the new machines; these changes to the software are expected to be minor. The rehosting strategy is evaluated in seven areas. First, how reliable is the system. Second, how well will the system perform under expected workloads. Third, how serious are the technical obstacles to adapting the software to run on the new machines. Fourth, what would the new system cost. Fifth, what problems would be encountered during the transition to the new system. Sixth, how quickly could the system be procured. Seventh, how well adapted is the system to future growth. The conclusion is that the rehost strategy is technically feasible, but there is some uncertainty about what this strategy would cost and how long the procurement process would take. (Author)

PB82-259151 PC **A05**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Noise Abatement and Control.
Airport Noise: Land-Use Compatibility by the Year 2000,
Robert J. Koenig, and John Tyler. Aug 82, 98p EPA-550/9-82-344

This report reviews the progress which has been made in airport noise control and presents a forecast of changes in aviation noise exposure that will occur during the balance of this century. Results are given of an analysis which examines the benefits of noise abatement flight operations, flight procedures and of restrictions on population encroachment, on residential noise exposure. Cost of residential soundproofing and relocation, based upon in-depth studies, are presented for four air carrier airports which represent four airport categories. While the main focus of the report is on noise exposure above Ldn 65 at air carrier airports, noise exposure around general aviation and joint-use civil/military airports is also discussed.

2. AGRICULTURE

2A. Agricultural Chemistry

PB82-260175 PC **A04**/MF **A01**
International Fertilizer Development Center, Muscle Shoals, AL.
Mexico: The Fertilizer Industry.
1979, 64p AID-PN-AAJ-022
Grant AID/ta-G-1218

A rapidly expanding domestic fertilizer market and a desire to capitalize on indigenous raw material deposits have resulted in Mexico's rapid emergence as a major fertilizer producer. This report reviews Mexico's fertilizer industry in terms of its past progress, its current resources, and its future plans for producing an adequate supply of fertilizer to meet the country's need for increased crop production. During the past decade, fertilizer use in Mexico has nearly doubled, exceeding a million metric tons (MT) of plant nutrients in 1978; it is expected to double again by 1985.

PB82-261371 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Reactions of Chrome Tannery Sludge with Organic and Mineral Soils.
Journal article,
Carlos Wickliff, V. V. Volk, David T. Tingey, William L. Griffis, and Marita Y. Trunk. 21 Aug 81, 16p EPA-600/J-82-216
Pub. in Water, Air, and Soil Pollution 17, p61-74 1982.

Chrome tannery sludge applied to agricultural land may have benefits in terms of added N for crop growth. An experiment was designed to compare tannery waste with commercial N fertilizer and investigate the potential of the waste as an alternative or supplement to commercial fertilizer. Soils with 38% and 7% organic C and N content of 1.3% and 0.2%, respectively, were amended with lime, commercial N fertilizer, or tannery sludge containing 1.6% Cr. A portion of the tannery waste was supplemented with additional Cr(+3) salt before adding to the soils. The amended soils were analyzed for total Cr, ammonium acetate extractable Cr, selected nutrient and trace element concentrations. The tannery sludge increased soil pH, total Cr and N, S, Ca, P, Mg, and Na concentrations. DTPA extractable Cr increased only when Cr(+3) salt was added, but soil pH decreased markedly. Electroconductivity exceeded values recommended for successful crop production. The acidic, high salt conditions complicated interpretation of the Cr(+3) salt addition results. Tannery sludge may be applied to agricultural land as a fertilizer amendment without adversely affecting soil chemical properties. The amount and frequency of application should be determined by (1) total and available N, (2) total salt content, (3) total and available Cr, and (4) soil organic matter.

2B. Agricultural Economics

PB82-242249 PC **A05**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Developments in Farm to Retail Price Spreads for Food Products in 1981,
Denis Dunham. Sep 82, 80p AER-488
See also PB81-192890.

The difference between what farmers receive and what consumers pay for food products, or farm to retail price spread, has been the main contributor to the rise in retail food prices in recent years. This report contains analysis of the farm to retail spread for a market basket of foods and selected items including beef, pork, milk, poultry, potatoes, and bread. The 1981 farm value averaged 35 percent of the price for a market basket of foods, dropping from 37 percent in 1980, and was the lowest in two decades. In 1981, abundant food supplies held down farm prices; retail prices rose faster because of processing a marketing charges.

PB82-242843 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Major Uses of Land in the United States: 1978.
Agricultural economic rept.,
H. Thomas Frey. Aug 82, 29p AER-487
See also PB80-114226.

Major primary uses of the U.S. land area of 2,264 million acres in 1978 were: cropland, 471 million acres; grassland pasture and range, 587 million acres; forest land, 703 million acres; transportation, recreation, and other special uses, 158 million acres, and miscellaneous land, 345 million acres. From 1974 to 1978, cropland area increased 1 percent and special uses increased 7 percent, while pasture-range and forest land each declined 2 percent.

PB82-244021 PC **A08**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
World Indices of Agricultural and Food Production, 1972-81.
Statistical bulletin.
Aug 82, 172p SB-689
See also PB81-245029.

Indices of total and per capita agricultural and food production for 1972-81 are presented for 108 countries and the world. Country indices are calculated by the Laspeyres' base-weighted aggregate formula. Selected production data are given in 1,000 metric tons by country. World agricultural production grew at a compound annual rate of 2.5 percent since 1950, while the rate on a per capita basis was only 0.7 percent.

PB82-252081 PC **A17**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Food and Agricultural Policy Simulator (FAPSIM): Structural Equations and Variable Definitions.
Staff rept.,
Kenneth E. Gadson, J. Michael Price, and Larry E. Salathe. May 82, 400p AGES-820506

This report provides a detailed description of the structural equations and their statistical attributes in the current version of the Food and Agricultural Policy Simulator (FAPSIM). FAPSIM is an annual econometric model of the U.S. agricultural sector. It estimates a simultaneous price-quantity equilibrium solution for a set of individual commodity models developed for beef, pork, dairy, chickens, eggs, turkeys, corn, oats, barley, grain sorghum, wheat, soybeans, and cotton. It also endogenously estimates farm production expenses, cash receipts, net farm income, Government deficiency and reserve storage payments, consumer price indexes for food products, and farmer participation in Government commodity programs.

PB82-255969 PC **A02**/MF **A01**
Economic Research Service, Washington, DC.
Agricultural Exports: Outlook and Situation.
May 82, 21p
Prepared in cooperation with Foreign Agricultural Service, Washington, DC.

U.S. agricultural exports are expected to decline about 4 percent in values in fiscal 1982, to $42 billion, because of substantially lower prices for major export commodities. However, the value of U.S. agricultural imports, forecast at $15 billion, is expected to be lowest in 4 years. Consequently, the agricultural trade surplus may widen to a record $27 billion. Volume of U.S. exports may rise 6 million tons to a record 168.5 million. U.S. exports during October-March fell 10 percent in value and 3 percent in volume from strong year-earlier levels. The strong dollar and sluggish economic conditions will continue to hurt the volume and value of U.S. exports the rest of the year. However, export value could benefit from some price gains this summer for grains and oilseeds and continued price strength for animal products.

PB82-257858 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Livestock and Meat: Outlook and Situation,
Ronald Gustafson, and Leland Southard. Aug 82, 27p LMS-247
See also report dated May 82, PB82-219072.

The expansion of the cattle inventory, which began in 1980, has apparently ceased. A harsh winter, financial difficulties, and poor forage conditions through late winter in the Southeast contributed to a 1-percent decline in the inventory, compared with a year earlier. In contrast, cattle numbers at the beginning of this year had increased 1 percent from January 1, 1981, and 4 percent from the 1979 cyclical low.

PB82-257866 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Fruit: Outlook and Situation,
Ben W. Huang, and Barbara J. Nartic. Jul 82, 31p TFS-223

Smaller fruit supplies keep prices high. Frost, rain, and hailstorms this spring reduced yields of most noncitrus fruit in California and peach production in the South. Therefore, the 1982 summer deciduous crop (excluding dried prunes) will likely be 16 percent less than last year. Consequently, fruit prices at all levels will remain substantially above a year ago.

PB82-257924 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Fats and Oils: Outlook and Situation,
Leslie L. Herren. Jul 82, 25p FOS-308
See also PB82-213646.

Anticipation of larger 1982 soybean crop holds down prices. After rising from a February low of $5.99 a bushel to $6.27 in May, farm prices for soybeans fell to $6.07 in June. Prospects for a 1982 crop that is larger than this year's will continue to offset limited improvement in nearterm demand--holding down prices this summer.

PB82-258369 PC **A05**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Costs of Producing Selected Crops in the United States - Final 1979, 1980, and Preliminary for 1981.
Jun 82, 85p
See also report for 1977, 1978, and 1979, PB82-297046.

Costs of producing 11 major U.S. crops rose in 1981 with the largest increases being in seed prices (17 percent), short-term interest rates (14 percent), and fuel prices (13 percent). Seed prices in 1981 increased primarily because of the rise in crop prices in 1980, due in many cases to the drought-reduced 1980 harvest. From 1980 to 1981, average variable costs per acre increased by 40 percent for peanuts, 22 percent for cotton, 15 percent for corn, sorgum, soybean, and wheat, 11 percent for rice, flax and sunflowers, and 9 percent for barley and oats. The large increase in peanut costs was due to the rise in peanut seed prices in 1981 and added costs of harvesting, hauling, and drying the 1981 peanut crop, which was 71 percent larger than the 1980 crop.

PB82-259243 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Cotton Ginning Charges, Harvesting Practices, and Selected Marketing Costs, 1981/82 Season,
Edward H. Glade, Jr., and Ron Cole. Aug 82, 6p
See also report for 1980-81, PB82-104886.

The average charge for saw-ginning and wrapping a 480-pound net weight bale of upland cotton in the United States was $42.90 during the 1981/82 season, a decrease of 87 cents per bale from 1980/81. Average charges varied from $31.25 in Louisiana to $48.83 in Oklahoma. The number of active cotton gins in 1981/82 was 2,186, compared with 2,253 during 1980/81. Gin numbers varied from 40 in North Carolina to 759 in Texas.

PB82-259656 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.

Farm Real Estate Market Developments: Outlook and Situation,
John F. Jones, and James Hrubovcak. Jul 82, 33p CD-87

Farmland values in the United States declined an average of 1 percent from February 1981 to April 1982. On a per acre basis, the value of farmland dropped to an average $788, compared with $795 in 1981. The decline follows increases of 16 percent in 1979 and 9 percent in 1980.

PB82-259664 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Vegetable: Outlook and Situation,
Barbara J. Peacock, Michael Stellmacher, and Barbara Johnson. Jul 82, 31p TVS-225
See also PB82-218934.

Fresh vegetable supplies this summer will likely be slightly higher than last year. Grower prices are expected to average below a year ago. However, increased marketing costs could keep retail prices of fresh vegetables above last year. Meanwhile, larger supplies of frozen vegetables and the slower increases in marketing costs will likely temper year-to-year increases in prices of processed vegetables. The larger planted area of fall-crop potatoes suggests that grower and retail prices of fresh and processed potatoes through early 1983 may be lower than a year earlier.

PB82-259672 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Demand and Price Analysis for Frankfurters.
Staff rept.,
Theresa Y. Sun. Aug 82, 21p AGES-820804

This report examines the direct-and cross-price elasticities and flexibilities for frankfurters sold through retail stores--beef, poultry, and all meat. Demands for these frankfurters are generally price elastic. The range of bimonthly direct price elasticities is about 3-1 for these products. There is significant substitution between beef and other types of frankfurters, especially poultry frankfruters. Price flexibility estimates indicate that only the consumption of all meat frankfurters influences other frankfurter prices negatively. Estimates of changes in frankfurter sales volumes and receipts, and the derived price for mechanical debonded poultry, the primary ingredient in poultry frankfurters, were obtained.

PB82-259755 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Wheat: Outlook and Situation,
Allen Schienbein. Jul 82, 25p WS-261
See also PB82-242702.

The report presents the economic outlook for wheat during the 1982/83 season. The forecast indicates that there will be a banner crop, record supplies, prospective strong exports, and continued relatively low prices.

PB82-259771 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Dairy: Outlook and Situation,
Clifford M. Carman, and Barbara A. Claffey. Jun 82, 26p DS-389

Milk output remains large, but dairy expansion may be slowing. A harsh winter and weak milk prices probably acted in concert to slow the output expansion. Milk production in first-quarter 1982 increased from a year earlier, but at a slower rate. The number of milk cows on farms decreased from January to March, but remained 1 percent above a year ago. March output per cow was virtually unchanged from a year ago.

PB82-260340 PC **A19**/MF **A01**
International Crops Research Inst. for the Semi-Arid Tropics, Hyderabad (India).
Proceedings of International Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, 19-23 February 1979, Hyderabad, India,
J. G. Ryan, and H. L. Thompson. Feb 79, 431p AID-PN-AAJ-522
Contract AID/ta-G-1406

New technologies cannot be disseminated in developing countries without an understanding of local socioeconomic conditions. Such is the view adopted by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in sponsoring the International Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, held February 19-23, 1979 in Hyderabad, India, of which this report comprises the proceedings. The Workshop's primary aim was to consider ways and means of overcoming the various socioeconomic constraints to agricultural development in the semi-arid tropics (SAT) and emphasis was focused on the role new technologies and/or policies could play in alleviating development constraints in SAT.

PB82-260894 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Tobacco: Outlook and Situation,
Verner Grise. Jun 82, 30p TS-180

Stocks to rise this season, but new crops likely to decline. Total use of U.S. tobacco this season will likely rise about 5 percent because of larger exports. Even so, use is expected to be 10 percent below 1981's large crop, so stocks carried over to the new marketing year (July 1 for flue-cured and October 1 for burley and other kinds) will likely increase from last year's 3.3 billion pounds.

PB82-260951 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Land Drainage Investment Survey, 1975-77: A Report on a Landownership Follow-on Survey.
Staff rept.,
Douglas Lewis. Jun 82, 35p AGES-820525

An estimated 29 million acres were affected by drainage investments in the United States during 1975-77 at a total cost of over $2.25 billion. About 415,000 ownership units drained an average of 70 acres at an average cost of about $95 per acre. Over 13.5 million acres were in the Cornbelt and Delta regions. Cropland was the dominant use of the drained land, both prior to and following drainage. Cash and savings of landowners were the source of over 80 percent of the capital necessary for drainage investments.

PB82-261108 PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Pilot Sample Survey for Estimating Yield of Cotton in Hissar (Haryana).
Annual rept. 1976-1977,
S. K. Raheja, P. C. Mehrotra, B. B. P. S. Goel, and V. S. Rustogi. 1978, 55p

With a view to develop suitable sampling methodology for forecasting and estimating the yield of cotton, a pilot sample survey was conducted in the Hissar district of Haryana, India. The survey covered both high yielding and local varieties of cotton.

PB82-261785 PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Estimation of Area of Grazing Land and Its Utilization, Jhansi District (Uttar Pradesh): A Pilot Survey,
K. C. Raut, U. G. Nadkarni, B. C. Saxena, and P. R. Sreenath. 1978, 68p

The object of the survey was to evolve a suitable sampling technique for estimating, with a reasonable degree of precision; (i) the area of grazing land; (ii) the average yield per unit of grazing area in different seasons; (iii) the composition of grazing available and its chemical contents in each season; and (iv) to obtain information on grazing practices followed in utilizing the grazing area available.

PB82-261793 PC **A03**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Sample Survey for Estimation of Production of Hides and Skins: Punjab 1974-1976,
J. S. Maini, B. B. P. S. Goel, and D. C. Dahiyac. 1976, 48p

A series of pilot sample surveys for developing suitable sampling methodologies for estimation of major livestock products were conducted by the Indian Agricultural Statistics Research Institute. This report gives the results of the survey for 1974-76.

PB82-262015 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Feed: Outlook and Situation,
Larry Van Meir, and Shirley Frye. Aug 82, 30p FDS-286
See also PB82-243890.

Record U.S. feed grain harvest in prospect. The 1982 U.S. feed grain harvest is estimated at 252 million metric tons--about 3.5 million larger than last year's record. The harvest will be taken from 106 million harvested acres, almost 1 percent fewer than harvested in 1981. The expected feed grain crop includes 8,315 million bushels of corn, 829 million of sorghum, 591 million of oats, and 509 million of barley. The corn and barley crops will be records if the harvest equals or exceeds the August 1 forecast.

PB82-262023 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Agricultural Outlook, August 1982.
Aug 82, 44p AO-79
See also PB82-241878.

Large crop supplies in prospect for new season. The early summer outlook points to large U.S. supplies of grains and oilseeds for the new marketing season, with the supply of soybeans likely to rise 3 percent from last year, wheat supplies 2 percent, and corn 4 percent. For wheat and corn, large carryovers from last year's harvests will more than offset this year's smaller expected production. Soybean carryover stocks will be down, but a prospective 6-percent larger crop will boost supplies--resulting in a weaker price outlook.

PB82-262031 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Discriminatory Pricing Under a U.S. Producer Board,
Philip L. Paarlberg, and Forrest D. Holland. Aug 82, 31p AGES-820722

This study simulates the consequences of replacing the competitive market for wheat and feed grains in the United States with a producer marketing board which practices price discrimination. A U.S. producer board for wheat and feed grains would increase prices in the nonfeed and export markets by reducing sales in those markets. Further, board carry-out stocks would rise, while prices in nonboard markets would fall to the loan rate. U.S. growers would receive windfall rents, most of which would be income transfers from U.S. consumers. The United States would receive a monopoly rent from foreign consumers. The board policy would support foreign producers through windfall gains. Finally, the board's operation would reduce the variability in grain prices.

PB82-262213 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Livestock and Meat: Outlook and Situation,
Ronald Gustafson, Leland Southard, and Richard Stillman. Jul 82, 21p LMS-246
See also PB82-219072.

Meat supplies to continue down. Total red meat and poultry production during first-half 1982 was 3 percent below year-earlier levels, contributing to higher cattle and hog proces than a year ago. Combined with lower feed costs, the improved prices created the most profitable situation for livestock producers since mid-1979. In the second half of the year, total meat production will continue well below a year ago as further declines in pork production more than offset modest gains in beef and broiler output.

PB82-262429 PC **A12**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Indian Agricultural Statistics Research Institute Annual Report 1979: Golden Jubilee Special.
R. K. Khosla, and D. P. Singh. 1979, 270p

IASRI is the premier institute in the country specializing in agricultural statistics. Its objective is to conduct and promote research and training in agricultural statistics.

In this report, major research activities have been highlighted. The major areas of research are: Statistical research in crop science; Crop forecasting methodology; Statistical research in animal sciences; Statistical genetics; Sample survey methodology; and Econometric analysis.

PB82-262502 PC **A06**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Sampling Methodology for Estimation of Egg Production and Study of Poultry Keeping Practices,
D. Singh, J. N. Garg, B. B. P. S. Goel, K. B. Singh, and M. Rajagopalan. 1977, 107p

The Indian Agricultural Statistics Research Institute carried out pilot sample surveys in different animal husbandry regions of the country for developing a suitable sampling methodology for estimation of annual output of principal livestock products. This report deals with the estimation of egg production and study of poultry keeping practices from the data collected in Northern and Southern regions of India.

PB82-262510 PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Estimation of Production of Lac,
D. V. S. Rao, and S. D. Bokil. 1978, 52p

A pilot sample survey for the estimation of lac production was carried out in the Palamau district of Bihar State during the years 1975-77. The main objective of the survey was to develop a suitable sampling technique for the estimation of number of lac hosts, number cultivated, total production of stick lac and average yield per tree. In addition, some studies on the socio-economic aspects of lac cultivation and on prediction of the average yield of stick lac are given in the report.

PB82-262643 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Land Clearing Investment Survey, 1975-77: A Report on a Landownership Follow-on Survey.
Staff rept.,
Douglas Lewis. Aug 82, 35p AGES-820728

Over 10.6 million acres were cleared for agricultural use in the United States during 1975-77 by 317,500 ownership units. These owners cleared an average of 33 acres at an average cost of about $175 per acre. Total investment in clearing exceeded $1.5 billion for the 1975-77 period. About 6 million acres were cleared in the Southern Plains, Appalachian, and Southeast regions. Pasture and rangeland was an important use of land, both before and after clearing.

PB82-262668 PC **A10**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Impact of Milk Supply Schemes on the Rural Economy in Milk Collection Areas of Delhi Milk Scheme.
J. P. Jain, K. P. S. Nirman, K. G. Aneja, and Prem Narain. 1978, 222p

A series of surveys for developing a suitable methodology for assessing the impact of urban milk supply schemes on rural economy in the milk-shed areas was carried out. This report deals with the sampling plan estimation procedure as also estimates of various response indicators for the bench-mark and repeat surveys, and the estimates of the impact of the Delhi Milk Scheme as measured in terms of these indicators. This report also contains a lot of incidental information on milk production and its utilization in the area, productivity of cultivated fodder and other crops, employment pattern, and economic status of rural families.

PB82-262866 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Agricultural Outlook, July 1982.
Jul 82, 52p AO-78
See also PB82-241878.

A sharp drop in pork production, combined with stable production of other livestock products, is expected to cut per-capita consumption of all livestock product foods by 2 percent this year. U.S. crop supplies for 1982/83 could large, leading to a possible wheat carryover of 1.3 billion bushels (36.1 million metric tons, 4.6 above a year earlier). The corn carryover could reach 2.1 billion bushels (53.3 million tons, up 4.4 million from last year).

PB82-263138 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Asia: Review of Agriculture in 1981 and Outlook for 1982,
E. Wayne Denney, and William T. Coyle. Aug 82, 45p
See also PB82-256082.

Agricultural production in Asia and Oceania improved in 1981, with record harvests of rice and wheat. Production was up 6 percent in South Asia, 4 percent in East Asia, and 5 percent in Oceania. Per capita agricultural production was up in all countries in the region except Afghanistan, Taiwan, Japan, and New Zealand. The balance of U.S. agricultural trade with the region increased 14 percent as exports reached $12.3 billion and imports fell to $3.5 million.

PB82-263146 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
China: Review of Agriculture in 1981 and Outlook for 1982,
Frederick W. Crook, and Frederic M. Surls. Aug 82, 44p

China's agriculture in 1981 continued the impressive gains registered since 1977. Grain production rose, and record crops of cotton, oilseeds, and sugar were harvested. Meat production was also a record. Agricultural imports dropped. Production will rise by a much smaller margin in 1982, but no significant increase in total agricultural imports is expected.

PB82-263302 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
World Agriculture: Outlook and Situation.
Jun 82, 33p WAS-28

Weakness in the world economy continues to restrain U.S. export values. Low growth rates in the major industrialized countries have boosted unemployment, dampening consumption of food and agricultural products. Limited foreign exchange in many developing countries has curbed their ability to increase food purchases. Also, slowed export growth and credit constraints in some centrally planned countries have diminished their imports.

PB82-263393 PC **A02**/MF **A01**
Agricultural Cooperative Service, Washington, DC.
Status of Bargaining Cooperatives,
Gilbert W. Biggs. Apr 82, 19p ACS/RR-16

The report reviews the status and scope of cooperative bargaining in the United States, including such factors as numbers of associations and members; commodities bargained, including physical units and dollar values; methods of financing operations; bargaining procedures; and trends in bargaining. One main objective was to determine how many associations actually engaged in successful negotiations - those producing contracts - over price and terms of trade.

PB82-263633 PC **A07**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
An Analysis of the Factors Affecting the Utilization and Trade of Grains and Soybeans in the United Kingdom,
David Colman, Tim Josling, and Trevor Young. Jul 82, 138p AGES-820720

Assumptions about the 'most likely' trends in threshold and intervention prices, inflation, and green rates between 1978/79 and 1985/86 result in a 3-percent annual real decline in cereal prices in the European Economic Community. Because of cereals price-induced shifts in livestock inventories, feed demand, human and industrial demand, and a feed mix shift from wheat to barley, wheat imports decline by 5.8 percent, soybean imports increase by 16 percent, barley exports disappear, and corn imports remain constant over this period. Changes in grain prices relative to one another do affect the distribution of imports/exports, while variations in the general level of grain prices do not.

PB82-263914 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Sub-Saharan Africa: Review of Agriculture in 1981 and Outlook for 1982,
Michael E. Kurtzig, and Mary Burfisher. Aug 82, 46p
See also PB82-256074.

Total agricultural production in Sub-Saharan Africa in 1981 was 4.3 percent above 1980. Per capita output was stable but still 11 percent below the 1969-71 base year. The 1981 harvest in Southern Africa was marked by record corn output in South Africa, Zimbabwe, and Malawi. South African exports reached record levels. In East Africa, however, Tanzania experienced its third consecutive year of drought and corn imports were high. Refugees and war continued to strain the economies of Ethiopia and Somalia. In Sub-Saharan Africa as a whole, oil importing countries did not experience any noticeable easing of pressure on meager foreign exchange, even with steady and in some cases lower world oil prices.

PB82-265059 PC **A03**/MF **A01**
Foreign Agricultural Service, Washington, DC.
Foreign Agriculture Circular: World Grain Situation/Outlook.
16 Aug 82, 34p FG-26-82

The outlook and statistics for wheat, coarse grains, rice, corn, sorghum and barley is included in the report.

PB82-265067 PC **A04**/MF **A01**
Foreign Agricultural Service, Washington, DC.
Foreign Agriculture Circular: World Oilseed Situation and U.S. Export Opportunities.
Summary rept.
Aug 82, 52p FOP-10-82

The report describes the world oilseed situation and U.S. Export opportunities for oilseeds (includes flaxseed, soybeans, cottonseed, rapeseed and peanut production).

PB82-265075 PC **A05**/MF **A01**
Economic Research Service, Washington, DC. Natural Resource Economics Div.
Drought of 1976-77 Central Valley, California.
Staff rept.,
Daniel G. Piper. Jul 82, 94p AGES-820624

This study examines the economic effects of the 1976-77 California Drought with emphasis on the Central Valley. 1976-77 was the driest two-year period in California's recorded weather history and severe economic losses were expected. But increased use of groundwater and reallocation of surface water by farmers and State and Federal authorities reduced the effects on crop yields. Also, prices of farm products rose because of lower production. So that, while individual farmers were adversely affected, net farm income was more than $2.5 billion, only 9% below the record high income of $2.8 billion in 1974.

PB82-266230 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Costs and Returns of Producing Milk in the United States - 1979, 1980, and Preliminary 1981.
Jul 82, 43p

This is the sixth annual report on the cost of producing milk in the United States. Estimates of the 1979, 1980, and 1981 costs and returns are presented in this report. The data on which these estimates are based came from a variety of sources, but the primary source is a 1980 survey of dairy farmers. The data are aggregated in this report to make regional and U.S. estimates.

2C. Agricultural Engineering

PB82-237504 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
New Technologies to Raise Agricultural Efficiencies.
Agriculture information bulletin,
Robert G. McElroy, and Kenneth R. Krause. Aug 82, 47p AIB-453

New technologies and continuing reseach have poised American agriculture on the threshold of a new technological era. Genetic engineering and improvements in plant and animal breeding promise new high-yield plants and animals. Innovations in chemistry promise higher crop yields and improved treatment of animal diseases. New machines and equipment will significantly increase farm size and efficiency. To be implemented, however, the new technologies will have to demonstrate their efficiency and safety.

PB82-255324 PC **A07**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Agricultural and Chemical Engineering.
Evaluating Furrow Irrigation Systems for Regional Water Quality Planning.
Final rept.,
Wynn R. Walker, and Gaylord V. Skogerboe. Jun 82, 127p EPA-600/2-82-078
Grant EPA-R-805811

Field evaluations of furrow irrigation practices at three Colorado locations were made during the 1979 irrigation season to develop a comprehensive data base. From these data, alternative field evaluation procedures were investigated as to the relationships between cost and accuracy. A simulation model based on traditional volume balance concepts was programmed and calibrated with the data base in order to evaluate if the relationships among furrow irrigation variables could be identified enroute to a general analysis of the effectiveness of improved practices on irrigation efficiency. Analysis of spatial and temporal field variabilities indicate large errors in estimating the irrigation efficiency of a furrow irrigation system unless field testing is comprehensive. Testing needs to include the first water application each season and at least three subsequent irrigations to yield representative results. Further, at least six individual furrows across the field should be studied.

PB82-257445 PC **A09**/MF **A01**
Agricultural Research Service, Riverside, CA. Salinity Lab.
Minimizing Salt in Return Flow Through Irrigation Management.
Final rept. 4 Dec 73-5 Dec 79.
Jun 82, 181p PUB-744, EPA-600/2-82-073
See also PB-272 637.

Two field experiments were conducted in southwest Arizona to investigate the potential of reducing the salt load in irrigation return flow by decreased leaching. Three leaching treatments of 5, 10, and 20%, replicated nine times for citrus and five times for alfalfa, were established and compared with conventional flood irrigation management. Annual evapotranspiration of mature Valencia orange trees was 1470 mm. During the first four years, the leaching treatments did not influence fruit yield or quality or tree growth. During the last year, however, the yield of the 5% leaching treatment was substantially lower than the other treatments. Both experiments verified that water applications could be reduced substantially below average commercial practice without loss of crop yield.

PB82-263385 PC **A04**/MF **A01**
Geological Survey, Sacramento, CA. Water Resources Div.
Evapotranspiration of Applied Water Central Valley, California, 1957-78.
Water-resources investigations (Final)
Alex K. Williamson. May 82, 62p USGS/WRI-81-45, USGS/WRD/WRI/82-061

In the Central Valley, where 57 percent of the 20,000 square miles of land is irrigated, ground-water recharge from agricultural lands is an important input to digital simulation models of ground-water flow. Several methods of calculating recharge were explored for the Central Valley Aquifer Project and a simplified water budget was designed where net recharge (recharge minus pumpage) equals net surface water diverted minus evapotranspiration of applied water (ETAW). This equation eliminates the need to determine pumpage from the water-table aquifer, assuming that the time lag for infiltration is not longer than the time intervals of interest for modeling. This study evaluates only the evapotranspiration of applied water.

2D. Agronomy and Horticulture

PB82-258849 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Herbicide, Defoliant, and Desiccant Use on Cotton in the United States,
Peter R. Rich. May 82, 52p AGES-820504

Farmers reported that 18.6 million pounds (a.i.) of herbicides and 23.2 million pounds of defoliants and desiccants were applied to cotton during 1979. Herbicide acre-treatments totaled 22.9 million and consisted of 20.5 million with single material herbicides, and 2.4 million with herbicide mixes. Defoliant and desiccant acre-treatments totaled 9.2 million and consisted of 8.1 million single material defoliants and desiccants and 1.1 million tank-mixes. The major herbicides were fluometuron, glyphosate, MSMA, and trifluralin. The primary defoliants and desiccants were arsenic acid, DEF, paraquat, and sodium chlorate. Coefficients of variation were computed for acres treated with specific pesticides.

PB82-259557 PC **A08**/MF **A01**
National Botanical Research Inst., Lucknow (India).
Dhaincha for Seed Gum; Dehydration of Flowers and Foliage; Damask Rose for Rose Oil and Rose Water; Matricaria for Blue Oil; Control Noxious Algae in Garden Tanks and Ponds; Mass Propagation of Dioscorea floribunda by Tissue Culture; and Extraction of Jasmine Flower Oil.
Extension bulletin 1-7,
V. Chandra, M. A. Kher, H. P. Srivastava, P. N. Misra, and P. N. Saxena. c1980, 157p

Contents: 'Dhaincha' for seed gum; Dehydration of flowers and foliage; 'Damask' Rose for rose oil and rose water; Matricaria for blue oil; Control noxious algae in garden tanks and ponds; Mass propagation of Dioscorea floribunda by tissue culture; Extraction of jasmine flower oil.

PB82-260142 PC **A03**/MF **A01**
International Rice Research Inst., Los Banos, Laguna (Philippines).
A Methodology for Determining Insect Control Recommendations.
Research paper series,
J. A. Litsinger, M. D. Lumaban, J. P. Bandong, P. C. Pantua, and A. T. Barrion. Jan 80, 34p IRPS-21, AID-PN-AAJ-081
Grant AID-DSAN-G-0083

A cropping systems approach has recently emerged as an effective means of improving insect control--a task which, because of its complexity, high demand on resources, and location-specific nature, has impeded past efforts to produce onfarm yields comparable to those obtained at research stations. This report explains the role of cropping systems research in insect pest control and outlines a methodology for determining insect control recommendations. Cropping systems research entails specifying a given insect pest control technology by taking into account cropping patterns of individual farmers, the geographical and temporal distribution of pests, environmental parameters, cultural practices, and insecticide application methods.

PB82-261090 PC **A05**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Salient Research Findings - 1978-79,
L. P. Upadhaya. 1980, 84p
Portions of this document are not fully legible.

This report includes research findings of the Assam Agricultural University in the field of agricultural science. The major areas of research are: cereals; grain legumes; soybean, oilseeds; sugar crop; potato; forages; fibre crops; hill agriculture; farm forestry; water management; stored grain pests and control of rodents; fungal diseases; and efficient use of fertilizers.

PB82-261207 PC **A07**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Monograph on Estimation of Incidence of Crop Pests and Diseases and Yield Losses,
Daroga Singh, and R. K. Khosla. 1981, 145p

It is a known fact that the pests and diseases cause considerable crop losses in every season in this country, but reliable and objective estimates of incidence of pests and diseases and also crop losses in quantitative terms are not available. This monograph will serve as guidelines to the research workers for conducting the sample surveys for estimation of incidence of pests and diseases and consequent quantitative crop losses.

PB82-261215 PC **A04**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Monograph on Statistical Studies on the Behaviour of Rainfall in a Region in Relation to a Crop,
P. N. Bhargava, P. Narain, D. Singh, and Asha Saksena. 1977, 75p

Recognizing the important role of rainfall in increasing or depressing the crop production and lack of availability of statistical methodology for their investigation, Institute of Agricultural Research Statistics initiated studies for the development of a statistical methodology to investigate the various aspects of rainfall in a particular region in relation to crop. In this monograph the statistical methodology developed for various aspects of rainfall in relation to a crop as well as the results obtained are discussed.

PB82-261223 PC **A06**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
D. /Singh ;P. N. /Bhargava ;R. K. /Khosla ;Asha / Saksena
1975, 106p

In agricultural experiments the experimenter is generally faced with the problem of adopting the suitable size and shape of the plot so that he can obtain the maximum information from his experimental material. In view of this, Institute of Agricultural Research Statistics collected data on uniformity trials for different crops and made investigations for arriving at suitable size and shape of plots. This monograph gives the results obtained from the analysis of uniformity trials data of various crops and also the methodology adopted for the purpose.

PB82-261272 PC **A06**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Journal of Research, Assam Agricultural University. Volume 1, Number 1,
D. Saharia. Feb 80, 118p

This report contains research papers on fundamental and applied research dealing with agriculture, veterinary, and allied sciences. The topics covered are: Effect of organic matter and moisture levels on changes in redox-potential of a rice-field soil and uptake of phosphorus, iron, and manganese by rice seedlings; a comparative study on conception rate of liquid and frozen bovine semen in Assam; effects of frequency of milk on production and composition of milk in Murrah buffaloes; effect of Rhizobium inoculation; application of molybdenum, lime, and nitrogen on soybean; amorphous materials in soil clays of Assam; and effect of body weight and linear body measurement at weaning on final body weight of Landrace pigs.

PB82-261280 PC **A06**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Journal of Research, Assam Agricultural University. Volume 2, Number 1,
D. Saharia. Feb 81, 125p

The report contains research papers on: Genetic variability of certain quantitative characters in rape; Response of Mung (Vigna radiata) cultivators to environmental variability. I. phenotypic stability for yield and yield attributing characters; The biochemistry of rice plants as influenced by organic soil amendments and its relation to bacterial leaf streaks; Estimates of heritability of body weights and daily weight gains in lan-

drace pigs; and Semen characteristics and fertility in Jersey and cross-bred bulls.

PB82-261298 PC **A06**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Journal of Research, Assam Agricultural University. Volume 1, Number 2,
D. Sahariac. Aug 80, 123p

The report contains research papers on: Protein requirements of growing indigenous pigs of Assam; Genetic and environmental factors affecting production traits in Landrace pigs; Studies on selection indices and discriminant functions for yield components in semidwarf rice; Genetic parameters of variation and character association in toria; Genetic variability in growth rate of broiler chicks in a 3 x 3 diallel cross; and Effect of rate and time of application of triiodobenzoic acid 'tiba' on 'bragg' soybean (Glycine Max (L) Merril) at two planting densities.

PB82-262049 PC **A04**/MF **A01**
Bureau of Reclamation, Washington, DC.
Precipitation Enhancement Effects on Grain Sorghum, Using a Daily Growth Model,
R. C. James, and R. L. Eddy. Apr 82, 53p

Application of a precipitation enhancement technology to provide additional water directly on crops and rangeland raises questions about the effects on crop yield of the amount and timing of additional precipitation. This paper presents the results of using a model simulatiNG the daily growth and development of a grain sorghum plant to investigate these effects. Data from five sites located in the central and southern High Plains were used. The model was exercised with observed precipitation and temperature and with 15 precipitation enhancement scenarios. These scenarios werE selected to provide a rang of precipitation conditions that could reasonably be expected from a weather modification program.

PB82-262411 PC **A02**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Nematode Pests of Crop Plants - An Appraisal with Special Reference to Research Work in Assam.
Research hand-out no. 1,
P. N. Phukan. Sep 80, 25p

Importance of the study of plant parasitic and free-living nematodes is now well recognized in almost all countries of the world. Nematodes have been causing damage to agricultural crops either singly or in association with other pathogens, greatly so in the tropical and subtropical regions. This bulletin records the work done by the University in the study and control of nematodes.

PB82-874827 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plant Growth Regulators. February, 1977-September, 1982 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Feb 77-Sep 82.
Sep 82, 322p
Supersedes PB80-850159.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the use and effects of plant growth regulators. Plant maturation, morphology, and chemical composition are discussed. Residue analysis and toxicology are also considered. (This updated bibliography contains 345 citations, 145 of which are new entries to the previous edition.)

2E. Animal Husbandry

AD-A118 656/8 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Trypanosoma congolense: Thrombocyte Survival in Infected Steers,
John M. Preston, Robert M. Kovatch, and Bruce T. Wellde. 11 Sep 81, 6p
Pub. in Experimental Parasitology, v54 p129-133 1982.

No abstract available.

PB82-261199 PC **E03**/MF **E03**
Commission of the European Communities, Luxembourg.
Reports of the Scientific Committee for Animal Nutrition (Third series).
c1981, 33p IA-)ISBN-92-825-2552-X, EUR-7383-EN
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The topics on feed additives considered are: fumaric and maleic acids as preservatives of feedingstuffs, hydrochloric and sulphuric acids as preservatives in silage and molasses feed, the dispersant polyethylene glycol 6000, and the emulsifier polyoxypropylene-polyoxyethylene polymer, the coccidiostat arprinocid for chickens, and inactivated cultures of certain enteropathogenic Eschericia coli serotypes to elicit and maintain surface intestinal immunity in piglets. The Committee finds that the proposed conditions of use are satisfactory. Dosage of arprinocid, teratogenic for rats and mice but not for rabbits, should be withdrawn at least five days before slaughter. Guidelines for the assessment of microorganism protein, intended for animal feed, are laid down. (Copyright (c) ECSC-EEC-EAEC, Brussels - Luxembourg, 1981.)

PB82-261777 PC **A03**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Estimation of Birth and Death Rates in Bovine: A Pilot Survey in Andhra Pradesh.
T. Jacob, B. Marutiram, and S. N. Arya. 1978, 35p

Estimation of projected population of animals is essential for formulating scientific plans for increasing livestock production. The report contains results and discussions pertaining to population structure; breed composition; age distribution; fertility rates; mortality rates; combined ratio estimates; and causes of mortality.

PB82-262064 PC **A05**/MF **A01**
Indian Agricultural Statistics Research Inst., New Delhi.
Sampling Methodology for Estimation of Meat Production.
D. Singh, J. S. Maini, B. B. P. S. Goel, and G. S. Bassi. 1978, 89p
Portions of this document are not fully legible.

The Indian Agricultural Statistics Research Institute has been engaged in the work of developing an integrated sampling technique for simultaneous estimation of principal livestock products. Two pilot investigations for the purpose were conducted in the Northern and Southern regions. This report deals with the results of the data on estimation of meat production and related aspects for the surveys conducted in both the regions.

2F. Forestry

PB82-256918 PC **A02**/MF **A01**
Intermountain Forest and Range Experiment Station, Ogden, UT.
Fire-Climate Zones of Coastal Alaska.
Forest General technical rept.,
Arnold I. Finklin. Jul 82, 21p FSGTR-INT-128
Color illustrations reproduced in black and white.

Fire-climate zones for coastal Alaska (Forest Service, Region 10) are identified in the report. The zones are based on five fire-climate derived through multiple regression using simple climate averages--May-August rainfall and daily maximum temperature--and a parameter of fire danger. The regression, based on data from 18 stations, was applied to the climatic averages from about 100 additional stations.

PB82-258864 PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Broomall, PA.
Economical and Simple Production of Containerized Hardwood Seedlings.
Forest Service research paper (Final),
Merrill C. Hoyle. 1982, 16p NEFES/82-44, FSRP-NE-500

An automatic mat-watering system for growing hardwood seedlings in containers was designed and tested. The system has only one moving part, and no electrical requirements. There is no need to calculate different watering schedules for different growth phases, different hardwood species, or different evapotranspiration conditions. Results were excellent with mat watering combined with simple, peat-vermiculite mixes, and pelleted, slow-release fertilizers. The system is economical, simple, and physiologically ideal.

PB82-261454 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Effects of Sulfuric Acid Rain on Major Cation and Sulfate Concentrations of Water Percolating Through Two Model Hardwood Forests.
Journal article,
Jeffrey J. Lee, and David E. Weber. Mar 82, 10p
EPA-600/J-82-226
Pub. in Jnl. of Environmental Quality, v11 n1 p57-64 Jan-Mar 82.

Acid precipitation falls on vast areas of forested land, including most of the eastern deciduous forest of the United States. Forest productivity, ground-water quality, and surface waters might all be affected. To document and quantify ecosystem response to the onset of acid precipitation, simulated sulfuric acid (H_2SO_4) rain was applied to model forest plots of sugar maple (Acer saccharum) and red alder (Alnus rubra). One set of four plots (two alder and two maple) received a control rain consiting of a stock solution equilibrated with atmospheric CO_2 to approximately pH5.7. Final results showed that a hardwood canopy and litter layer can alter the input of chemicals to the soil from acid rain.

PB82-262247 PC **A02**/MF **A01**
National Park Service, Atlanta, GA. Southeast Regional Office.
An Ecological Investigation of a Spruce-Fir Burn in the Flott Balsam Mountains, North Carolina.
Research/Resources Management rept.,
Paul Richard Saunders, George S. Ramseur, and Garrett A. Smathers. Aug 81, 24p R/RM/SER-48

In 1955 a small campfire near Waterrock Knob in the Plott Balsam Mountains along the Blue Ridge Parkway escaped and burned about one hectare of mature red spruce-Fraser fir forest. The resultant forest community that regenerated on this site contains some of the species commonly associated with mature and logged spruce-fir stands. However, many of the species present are primarily disturbance species associated with fire cherry communities and grass and health balds. The dense shrub layer and slow recovery of the site suggest that a severe fire, or a fire followed by erosion, has resulted in conditions that account for the unique composition of this stand. Analysis of the regeneration of this site may provide clues to patterns of spruce-fir succession, and the formation of southern Appalachian Mountain health balds.

PB82-262338 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Hawaiian Treefern Harvesting Affects Forest Regeneration and Plant Succession.
Forest Service research note (Final),
Michael G. Buck. Apr 82, 10p FSRN-PSW-355

The effects of Hawaiian treefern (Hapu'u (Cibotium spp.)) harvesting on forest regeneration and plant succession were studied on 150 acres (60.6 ha) on the island of Hawaii, from 1972 to 1980. Results to date indicate that native species composition in the treefern forest is altered by harvesting activities. Heavy, uncontrolled harvest can result in extensive displacement of native plants by introduced species.

PB82-262817 PC **A03**/MF **A01**
Southeastern Forest Experiment Station, Asheville, NC.
Multiresource Inventories: Forest Biomass in Florida.
Forest Service research paper,
Noel D. Cost, and Joe P. McClure. Aug 82, 28p
SEFES-82-9, FSRP-SE-235

Florida's 15.7 million acres of timberland support 864 million tons of forest biomass, or an average of 55.2 tons per acre. This total exceeds the green weight of conventional growing stock by 73 percent. More than 38 percent of the biomass is in stands where wood

could be harvested for energy in harmony with conventional forestry practices. Over the next 2 decades, about 14.0 million tons of forest biomass could be harvested annually without adversely affecting timber supplies.

PB82-263054 PC **A22**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa).
Proceedings: Symposium on Forest Products Development in the 80's, 30 Apr-1 May 1981.
1981, 518p CSIR-S-250, ISBN-0-7988-2096-9
Text in English and Afrikaans.

Contents: The demand for forest products in the next decade; The expected impact of the economy on the development of the forest products industry in the next decade; The factors influencing the distribution of forest products in the next decade; The expected impact that technological innovation will have on the development of the forest products industry; The technological changes needed in the forest products industry to meet future demands; The timber supply as a response to future demands for forest products.

PB82-264979 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Mapping Pine Mortality by Aerial Photography, Umstead State Park, North Carolina.
Forest Service research paper (Final),
Clarence J. DeMars, Garey W. Slaughter, Lula E. Green, and John H. Ghent. Feb 82, 20p FSRP-PSW-158

In 1975-1976, pine trees killed by the southern pince beetle (Dendroctonus frontalis) in a 2170-hectare (5362-acre) area at the William B. Umstead State Park in central North Carolina, were monitored by sequential color infrared aerial photography. From 1973 through summer 1975, beetles in 350 infestation spots killed more than 20,500 pines on 137 hectares (339 acres). From October 1975 to July 1976, an additional 301 dead pines were detected at 146 tree mortality centers. Southern pine beetles were associated with 98 percent of these dead trees. Pine mortality dropped rapidly from 248 trees killed in fall and winter at 120 spots to 9 trees killed during the outbreak exceeded 16,000 cu m (7500 cords) of roundwood valued at more than $240,000.

PB82-265125 PC **A02**/MF **A01**
Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.
Resource Values in Analyzing Fire Management Programs for Economic Efficiency.
Forest Service general technical rept. (Final),
Irene A. Althaus, and Thomas J. Mills. Feb 82, 16p FSGTR-PSW-57

In analyzing fire management programs for their economic efficiency, it is necessary to assign monetary values to the changes in resource outputs caused by fire. The process of measuring fire effects in program evaluations introduces implication unique to the resource valuation process. Sensitivity analysis can help determine the required accuracy of resource value estimates for a particular analysis.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

N82-30194/6 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of Photometric Data for Nearby Stars.
W. H. Warren, Jr.. Apr 82, 17p NASA-TM-84768, NSSDC/WDC-A-R/S-82-13

A computer list of all photometric systems (of those considered), in which each star was measured is provided. The file is a subset of a much larger and more comprehensive compilation, which lists all measured photoelectric photometric systems for any star that has been measured in at least one photoelectric system. In addition to the photometric system identifications, cross identifications to the Henry Draper and Durchmusterung catalogs and apparent visual magnitudes are included.

N82-30195/3 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of Faint Blue Objects at High Galactic Latitude.
W. H. Warren, Jr.. May 82, 12p NASA-TM-84769, NSSDC/WDC-A-R/S-82-14

The machine-readable data file of a catalog of objects selected according to relative ultraviolet excess from ubv 3-color 1.2 m Palomar Schmidt plates is described.

N82-30196/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of the Catalog of Galactic O Type Stars.
W. H. Warren, Jr.. May 82, 17p NASA-TM-84770, NAS 1.15:84770

The Catalog of Galactic O-Type Stars (Garmany, Conti and Chiosi 1982), a compilation from the literature of all O-type stars for which spectral types, luminosity classes and UBV photometry exist, contains 765 stars, for each of which designation (HD, DM, etc.), spectral type, V, B-V, cluster membership, Galactic coordinates, and source references are given. Derived values of absolute visual and bolometric magnitudes, and distances are included. The source reference should be consulted for additional details concerning the derived quantities. This description of the machine-readable version of the catalog seeks to enable users to read and process the data with a minimum of guesswork. A copy of this document should be distributed with any machine readable version of the catalog.

N82-30197/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of the Catalogue of Individual UBV and UVBY beta Observations in the Region of the Orion OB1 Association.
W. H. Warren, Jr.. May 82, 15p NASA-TM-84771, NSSDC/WDC-A-R/S-82-16

The machine-readable files of individual UBV observations of 106 stars in the vicinity of the Orion Nebula (the Sword region) and individual uvby beta observations of 508 stars in all regions of the Orion OB 1 association are described. For the UBV data the stars are identified by their Brun numbers, with cross identifications to the chart numbers used in Warren and Hesser; the uv by beta stars are identified by the aforementioned chart numbers and HD, BD or P (= pi); numbers in that order of preference.

N82-30198/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of the Third Santiago-Pulkovo Fundamental Stars Catalogue (Spf-3).
W. H. Warren, Jr.. May 82, 10p NASA-TM-84772, NSSDC/WDC-A-R/S-82-17

The machine-readable version of a catalog of right ascensions of 671 bright stars is described. The observations were made in a series consisting of 70 stars observed along the meridian from +42 deg to the pole in upper culmination and from the pole to -70 deg in lower culmination.

N82-30199/5 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of the Bright Star Catalogue.
W. H. Warren, Jr.. May 82, 24p NASA-TM-84773, NAS 1.15:84773

The machine-readable version of The Bright Star Catalogue, 4th edition, is described. In addition to the large number of newly determined fundamental data, such as photoelectric magnitudes, MK spectral types, parallaxes, and radial velocities, the new version contains data and information not included in the third edition such as the identification of IR sources, U-B and R-I colors, radial velocity comments (indication and identification of spectroscopic and occultation binaries), and projected rotational velocities. The equatorial coordinates for equinoxes 1900 and 2000 are recorded to greater precision details concerning variability, spectral characteristics, duplicity, and group membership are included. Data compiled through 1979, some information and variable-star designations found through 1981 are considered.

N82-30200/1 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Documentation for the Machine-Readable Version of the Lowell Proper Motion Survey Northern Hemisphere, the G Numbered Stars.
W. H. Warren, Jr.. May 82, 18p NASA-TM-84774, NSSDC/WDC-A-R/S-82-19

Observed positions, proper motions, estimated photographic magnitudes and colors, and references to identifications in other catalogs are included. Photoelectric data on the UBV system are included for many stars, but no attempt was made to find all existing photometry. The machine-readable catalog is described.

3B. Astrophysics

AD-A118 805/1 PC **A02**/MF **A01**
Stanford Univ., CA. Inst. for Plasma Research.
Observation of Additional Low-Degree Five-Minute Modes of Solar Oscillation,
Philip H. Scherrer, John M. Wilcox, Jorgen Christensen-Dalsgaard, and Douglas Gough. Apr 82, 16p Rept no. SUIPR-922
Contract N00014-76-C-0207

By measuring the difference between the shifts in the Fe 5124 spectrum line from light integrated from a central circular portion of the solar disk and from an annular portion exterior to it, we have been able to detect high-order solar oscillations with degrees l = 3, 4 and 5. The frequencies of the octupole modes agree well with the values obtained from whole-disk measurements at the South Pole. A least-squares fit of the observed frequencies to values interpolated between and extrapolated from the predictions of a sequence of solar models with different chemical compositions selects a model with a helium abundance somewhat greater than 25 per cent by mass.

DE82903430 MF **A01**
Oslo Univ. (Norway). Inst. of Theoretical Astrophysics.
Eighty-Year Period in Short-Lived Sunspots. Report No. 52.
T. S. Ringnes. 1981, 22p NP-2903430
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Analysis of the last two cycles of solar activity, Nos. 19 and 20, confirm previous findings of secular variations (the 80-year period) in number, distribution of area and other features of sunspots with lifelengths of about one day. (ERA citation 07:044883)

DE82903633 MF **A01**
Kyoto Univ. (Japan). Dept. of Physics.
Proton exp 1 S sub 0 -Dominant Superfluidity with Two-Dimensional Character under Well-Developed pi exp 0 Condensation.
T. Takatsuka, and R. Tamagaki. 1981, 21p KUNS-554
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Proton superfluidity under the well-developed pi exp 0 condensation in neutron star matter is investigated in the Alternating-Layer-Spin (ALS) model. Since proton

density is very low at the baryon density Rho = (1 approx. 3) rho sub 0 , rho sub 0 being the nuclear density, the pairing responsible for realization of proton superfluid is due to the exp 1 S sub 0 interaction between two protons in the nearest layers with anti-parallel spins, which is operative in the two-dimensional Fermi gas in the space perpendicular to the momentum of condensed pi exp 0 . The BCS scheme suitable for describing such pairing correlation is presented by using the Bloch-orbital basis converted from the localized basis. The proton energy gaps and critical temperatures calculated from an approximate version of the realistic local potentials are of the same order of magnitude, compared with those realized from the spherical Fermi gas state. Dependences of the results on effective mass, localization parameters and potentials are discussed. (ERA citation 07:048313)

DE82903640 MF **A01**
Kyoto Univ. (Japan). Dept. of Physics.
Attenuation of exp 3 P sub 2 -Superfluidity in Neutron-Star Matter Due to Charged-Pion Condensation.
T. Takatsuka, and R. Tamagaki. 1981, 6p KUNS-553
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

It is investigated how the exp 3 P sub 2 -type superfluidity of the main baryonic component in neutron star interior is affected due to the occurrence of charged-pion condensation. Notable attenuation effect is found in a simple model calculation. (ERA citation 07:048312)

N82-29336/6 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Digest of Celestial X-Ray Missions and Experiments.
M. C. Locke. Jan 82, 66p NASA-TM-84767, NAS 1.15:84767

Information on instruments, the platforms that carried them, and the data they gathered is presented. Instrument selection was confined to detectors operating in the 0.20 to 300 keV range. Included are brief descriptions of the spacecraft, experiment packages and missions. Cross-referenced indexes are provided for types of instruments, energy ranges, time spans covered, positional catalogs and observational catalogs. Data sets from these experiments (NSSDC) are described.

N82-29342/4 PC **A06**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Starprobe: Scientific Rationale.
Report of the Ad Hoc Working Groups.
J. H. Underwood, and J. E. Randolph. 15 Jun 82, 118p NASA-CR-169144, JPL-PUBL-82-49
Contract NAS7-100

The scientific rationale and instrumentation problems in the areas of solar internal dynamics and relativity, solar plasma and particle dynamics, and solar atmosphere structure were studied. Current STARPROBE mission and system design concepts are summarized.

N82-30084/9 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
A Model of Disparitions Brusques (Sudden Disappearance of Eruptive Prominences) as an Instability Driven by Mhd Waves.
J. Sakai, and K. I. Nishikawa. Apr 82, 30p IPPJ-569

A mode of 'disparitions brusques' (sudden disappearance of eruptive prominences) is discussed based on the Kippenhahn and Schluter configuration. It is shown that Kippenhahn and Schluter's current sheet is unstable against magnetic reconnecting modes during the lifetime of quiescent prominences. Disturbances in the form of fast magnetosonic wave originating from nearby active regions or the changes of whole magnetic configuration due to newly emerged magnetic flux may trigger a rapid growing instability associated with magnetic field reconnection. This instability gives rise to disruptions of quiescent prominences and also generates high energy particles.

N82-30203/5 PC **A02**/MF **A01**
Colorado Univ. at Boulder. Lab. for Atmospheric and Space Physics.
A Search for Diffuse Band Profile Variations in the rho Ophiuchi Cloud.
T. P. Snow, J. G. Timothy, and S. Sear. 1982, 22p NASA-CR-169111, NAS 1.26:169111
Grant NSG-7626

High signal-to-noise profiles of the broad diffuse interstellar band at 4430 A were obtained on the 2.2-m telescope at the Mauna Kea Observatory, using the newly-developed pulse-counting multi-anode microchannel array detector system in an effort to determine whether the band profile varies with mean grain size as expected if the band is produced by absorbers embedded in grain lattices. The lack of profile variability over several lines of sight where independent evidence indicates that the mean grain size varies shows that lambda 4430 is probably not formed by the same grains that are responsible for interstellar extinction at visible wavelengths. The possibility that this band is created by a population of very small (approximately 100 A) grains is still viable, as is the hypothesis that it has a molecular origin.

N82-30204/3 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
The Absence of Rapid X-Ray Variability in Active Galaxies.
Ph.D. Thesis - Maryland Univ.
A. F. Tennant, and R. F. Mushotzky. Jun 82, 41p NASA-TM-83966, NAS 1.15:83966
Submitted for Publication.

Variations on time scales ranging from minutes to several hours in the X-ray flux from 54 observations of 38 active galaxies are identified. The sample is composed mostly of Seyfert I galaxies but also includes radio galaxies, NELG's BL Lacs and 3C 273. Only NGC 6814 varied on time scales as short as 100 sec. No other source was observed to vary with a time scale of less than 12 hours. Large amplitude short term variations are not a characteristic of the X-ray emission from active galaxies. Upper limits on sigma sub I/I ranged from 2% for Cen A, 5% for NGC 4151, to approximately 20% for sources giving 1 ct/sec in the detector. Three objects NGC 3227, NGC 4151 and MCG 5-23-16 show variability consistent with a time scale of approximately 1 day. Ways to reconcile the rapid variability seen for NGC 6814 (and NGC 4051) with the general stability observed for the other objects are considered.

N82-30205/0 PC **A04**/MF **A01**
CosmoScience Associates, Inc., Stony Brook, NY.
Space Environment and Lunar Surface Processes, 2.
Final Report.
G. M. Comstock. 31 Jan 82, 53p NASA-CR-169190, NAS 1.26:169190
Contract NASW-3273

The top few millimeters of a surface exposed to space represents a physically and chemically active zone with properties different from those of a surface in the environment of a planetary atmosphere. To meet the need or a quantitative synthesis of the various processes contributing to the evolution of surfaces of the Moon, Mercury, the asteroids, and similar bodies, (exposure to solar wind, solar flare particles, galactic cosmic rays, heating from solar radiation, and meteoroid bombardment), the MESS 2 computer program was developed. This program differs from earlier work in that the surface processes are broken down as a function of size scale and treated in three dimensions with good resolution on each scale. The results obtained apply to the development of soil near the surface and is based on lunar conditions. Parameters can be adjusted to describe asteroid regoliths and other space-related bodies.

N82-30206/8 PC **A03**/MF **A01**
Martin Marietta Aerospace, Denver, CO. Denver Div.
Analysis and Interpretation of Viking Inorganic Chemistry Data (Mars Data Analysis Program).
Final Report.
B. C. Clark. Feb 82, 37p MCR-81-653, NASA-CR-169192
Contract NASW-3284

Soil samples gathered by the Viking Lander from the surface of Mars were analyzed. The Martian fines were lower in aluminum, iron, sulfur, and chlorine than typical terrestrial continental soils or lunar mare fines. Sample variabilities were as great within a few meters as between lander locations (4500 km apart) implying the existence of a universal Martian regolith component of constant average composition.

N82-30207/6 PC **A13**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
The Nature of Large-Scale Turbulence in the Jovian Atmosphere.
J. L. Mitchell. 15 Jan 82, 298p NASA-CR-169138, JPL-PUBL-82-34
Contract NAS7-100

The energetics and spectral characteristis of quasi-geostrophic turbulence in Jupiter's atmosphere are examined using sequences of Voyager images and infrared temperature soundings. Using global wind measurements momentum transports associated with zonally symmetric stresses and turbulent stresses are quantified. Though a strong up-gradient flux of momentum by eddies was observed, measurements do not preclude the possibility that symmetric stresses play a critical role in maintaining the mean zonal circulation. Strong correlation between the observed meridional distribution of eddy-scale kinetic energy and available potential energy suggests coupling between the observed cloudtop turbulent motions and the upper tropospheric thermodynamics. An Oort energy budget for Jupiter's upper troposphere is formulated.

N82-30208/4 PC **A04**/MF **A01**
Carmel Research Center, Santa Monica, CA.
Pioneer 10/11 Data Analysis of the Plasma Analyzer Experiment.
Final Report.
D. S. Intriligator. Mar 82, 64p NASA-CR-166378, NAS 1.26:166378
Contract NAS2-10925

The Pioneer 10 plasma analyzer detected the 10 plasma torus. Evidence was found of corotating ions which appear to be primarily S (+ +) and O (+ +) in the Pioneer 10 plasma data as the spacecraft moved inward from 6.9 to 5.4 R sub J. The Pioneer plasma analyzer was effective in obtaining information on the heavy ion populations in the Jovian magnetosphere. Interplanetary solar wind plasma shocks can trap energetic particles (cosmic rays) for weeks and out to distances of 17 AU. Energetic particles (o.5 MeV to 20 MeV) were confined between two plasma shocks from solar flares as the shocks propagated outward in the solar system.

N82-30209/2 PC **A13**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Earth and Planetary Sciences.
Studies of Planetary Upper Atmospheres Through Occultations.
Final Technical Report, 1 Jul. 1980- 30 Jun. 1982.
J. L. Elliot. 30 Jun 82, 292p NASA-CR-169189, NAS 1.26:169189
Contract NAGW-68

The structure, composition, dynamics and energy balance of planetary upper atmospheres through interpretation of steller occultation data from Uranus is discussed. The wave-optical problem of modelling strong scintillation for arbitrary turbulent atmospheres is studied, as well as influence of turbulence. It was concluded that quasi-global features of atmospheric structure are accurately determined by numerical inversion. Horizontally inhomogeneous structures are filtered out and have little effect on temperature profiles.

N82-30210/0 PC **A02**/MF **A01**
Arizona Univ., Tucson.
Comets.
L. L. Wilkening, and M. S. Matthews. 1982, 12p NASA-CR-169237, NAS 1.26:169237
Sponsored by NASA.

Vacuum ultraviolet observations from sounding rockets and satellite observatories of the gaseous comae of several comets are reviewed. The earliest of these led to discovery of the hydrogen envelope extending for millions of km from the nucleus. Subsequent observations of H I Lyman alpha, the OH (0,0 band and the oxygen resonance triplet provided strong evidence for the water-ice model of the cometary nucleus. Several species were discovered in the coma including C, C(+), CO, S, and CS. High resolution spectroscopy and the spatial variation of the observed emissions provide means to elucidate the production and excitation mechanisms of these species. The similarity of the spectra of the half dozen comets observed to date argues for a common, homogeneous composition (with the exception of dust and CO) of the cometary ice

and a minimal effect on the neutral species due to molecular collisions in the inner coma.

N82-30211/8 PC **A08**/MF **A01**
Herzberg Inst. of Astrophysics, Ottawa (Ontario).
Observations of Solar Flux at the Algonquin Radio Observatory on 2800 MHz and the Dominion Radio Astrophysical Observatory on 2700 MHz.
Monthly Report, Jan. - Dec. 1980.
M. B. Bell, H. P. Gagnon, and J. D. Moore. Jun 81, 156p ARO-10, NRC-19443

Daily tabulations of the radio flux at 2800 MHz from the Algonquin Radio Observatory and at 2700 MHz from the Dominion Radio Astrophysical Observatory are presented for the year 1980. This period marks the fifth year into sunspot cycle 21.

N82-30212/6 PC **A04**/MF **A01**
New Hampshire Univ., Durham. Space Science Center.
On the Preferential Acceleration and Heating of Solar Wind Heavy Ions.
P. A. Isenberg, and J. V. Hollweg. Jun 82, 53p NASA-CR-169105, NAS 1.26:169105
Contracts NAGW-76, NAG5-130

The feasibility of producing the observed velocities and temperatures of solar wind heavy ions by the resonant cyclotron interaction with left-polarized hydromagnetic waves was investigated. A 'most favorable case' scenario in which the waves are parallel-propagating and dispersionless and the energy for the wave acceleration and heating is taken from saturated low-frequency Alfven waves via a cascade to higher frequencies, is incorporated into a numerical solar wind code and agreement with observation is tested. The resonant cyclotron interaction is shown to fail on at least three points, even in this most favorable case.

N82-30213/4 PC **A03**/MF **A01**
New Hampshire Univ., Durham. Space Science Center.
Collisional Damping of Surface Waves in the Solar Corona.
B. E. Gordon, and J. V. Hollweg. Jun 82, 36p NASA-CR-169095, NAS 1.26:169095
Contracts NAGW-76, NAG5-130

The damping of surface waves by viscosity and heat conduction is evaluated. For the solar corona, it is found that surface waves dissipate efficiently only if their periods are shorter than a few tens of seconds and only if the background magnetic field is less than about 10 Gauss. Heating of quiet coronal regions is possible if the coronal waves have short periods, but they cannot heat regions of strong magnetic field, such as coronal active region loops.

N82-30214/2 PC **A03**/MF **A01**
California Univ., San Diego, La Jolla.
Solar Terrestrial Observatory.
Final Report.
Oct 81, 50p NASA-CR-162059, NAS 1.26:162059
Contract NAS8-33795

Eight basic solar-terrestrial scientific objectives that benefit from the Shuttle/Platform approach and a program of measurements for each are discussed. The objectives are to understand: (1) solar variability, (2) wave-particle processes, (3) magnetosphere-ionosphere mass transport, (4) the global electric circuit, (5) upper atmospheric dynamics, (6) middle atmospheric chemistry and energetics, (7) lower atmospheric turbidity, and (8) planetary atmospheric waves. A two stage approach to a multidisciplinary payload is developed: an initial STO, that uses a single platform in a low-Earth orbit, and an advanced STO that uses two platforms in differing orbits.

N82-30215/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Microwave and Hard X-Ray Observations of a Solar Flare with a Time Resolution of Better Than 100 Ms.
P. Kaufmann, F. M. Strauss, J. E. R. Costa, B. R. Dennis, and A. Kiplinger. Feb 82, 17p NASA-TM-84715, NAS 1.15:84715
Prepared in Cooperation with Instituto de Pesquisas Espaciais Submitted for Publication.

Simultaneous microwave and X-ray observations are presented for a solar flare detected on 1980 May 8 starting at 1937 UT. The X-ray observations were made with the Hard X-Ray Burst Spectrometer on the Solar Maximum Mission and covered the energy range from 28-490 keV with a time resolution of 10 ms. The microwave observations were made with the 5 and 45 foot antennas at the Itapetinga Radio Observatory at frequencies of 7 and 22 GHz, with time resolutions of 100 ms and 1 ms respectively. Detailed correlation analysis of the different time profiles of the event show that the major impulsive in the X-ray flux preceded the corresponding microwave peaks at 22 GHz by about 240ms. For this particular burst the 22 GHz peaks preceded the 7 GHz by about 1.5s. Observed delays of the microwave peaks are too large for a simple electron beam model but they can be reconciled with the speeds of shock waves in a thermal model.

PB82-258872 PC **A05**/MF **A01**
National Geophysical and Solar-Terrestrial Data Center, Boulder, CO.
Solar-Geophysical Data Number 451, March 1982. Part II (Comprehensive Reports). Data for September 1981, April 1980,
Helen E. Coffey. Mar 82, 98p SGD-451-PT-2, NOAA-82060302
See also Part 1, PB82-233784.

In addition to an index for 1981-1982, this issue of comprehensive reports provides data for September 1981 on solar radio emission, solar x-ray radiation and mass ejections from the sun. Solar flares for April 1980 are given. Miscellaneous data includes active regions 22 July - 18 August 1981 and synoptic solar maps 22 July - 18 August 1981.

PB82-261504 Not available NTIS
National Bureau of Standards, Washington, DC.
Far Infrared Spectra of H2 and Mixtures of H2-CH4 and H2-He.
Final rept.,
George Birnbaum. 1980, 3p
Sponsored in part by National Aeronautics and Space Administration, Washington, DC.
Pub. in Proceedings of NASA Workshop on Vibrational-Rotational Spectroscopy for Planetary Atmospheres, Annapolis, MD, March 17-19, 1980, 23p.

This report presents some recent laboratory measurements of the far infrared absorption of H2 and mixtures of H2 with CH4 and He and the fitting of the pure H2 spectra with a semi-empirical line shape. Such results are needed in analyzing the thermal emission from the atmospheres of the outer planets. The spectra discussed here, which are forbidden in the isolated molecule, are due to dipoles induced in colliding molecules by their electric fields.

PB82-261553 Not available NTIS
National Bureau of Standards, Washington, DC.
Low-Luminosity Accretion onto Magnetized Neutron Stars.
Final rept.,
S. H Langer, and S. Rappaport. Jun 82, 19p
Grants NSF-AST78-06714, NSF-AST80-19960
Pub. in Astrophysical Jnl. 257, n2 p733-751, 15 Jun 82.

The behavior of matter accreting at low rates onto the polar caps of a highly magnetized neutron star was studied. Flow solutions were found for the case in which the matter undergoes a stationary collisionless shock. The electron and ion fluids are treated separately, and the ion temperature is found to be much higher than the electron temperature throughout the flow. The self-consistency of the assumptions and the results are discussed in detail.

PB82-262684 PC **A08**/MF **A01**
National Geophysical and Solar-Terrestrial Data Center, Boulder, CO.
Solar-Geophysical Data Number 453. Part I (Prompt Reports). Data for April 1982, March 1982,
Helen E. Coffey. May 82, 155p SGD-453-PT-1, NOAA-82071907
See also Part 2, PB82-262692, and PB82-247396.

In addition to an index for 1981-1982, this prompt report provides data for April 1982 on: alert periods, daily solar indices, solar flares, solar radio emission, inferred interplanetary magnetic field polarities, mean solar magnetic field, spacecraft observations, and Boulder Geomagnetic Substorm Log. It also provides data for March 1982 on: daily solar activity centers, sudden ionospheric disturbances, solar radio emission, cosmic rays, and geomagnetic indices. Late data includes geomagnetic indices for February 1982.

PB82-262692 PC **A04**/MF **A01**
National Geophysical and Solar-Terrestrial Data Center, Boulder, CO.
Solar-Geophysical Data Number 453, May 1982. Part II (Comprehensive Reports). Data for November 1981,
Helen E. Coffey. May 82, 68p SGD-453-PT-2, NOAA-82071908
See also Part 1, PB82-262684.

In addition to an index for 1981-1982, this issue of comprehensive reports provides data for November 1981 on: solar radio emission, solar x-ray radiation, and mass ejections from the sun.

PB82-264086 Not available NTIS
National Bureau of Standards, Washington, DC.
The Effect of Reflected and External Radiation on Stellar Flux Distributions.
Final rept.,
D. G. Hummer. 15 Jun 82, 9p
Grant NSF-AST80-19874
Pub. in Astrophysics Jnl. 257, n2 p724-732, 15 Jun 82.

The effect of radiation emitted or scattered by circumstellar material, such as a stellar wind, and falling on the stellar photosphere is investigated on the basis of a gray model atmosphere generalized to include the effects of an external radiation field and a surface boundary condition describing the reflection of a specified fraction, depending on the frequency, of the outgoing radiation. Substantial modifications both to the temperature and flux distributions are found.

PB82-264227 Not available NTIS
National Bureau of Standards, Washington, DC.
On the Reality of a Boundary in the H-R Diagram between Late-Type Stars With and Without High Temperature Outer Atmospheres.
Final rept.,
T. Simon, J. L. Linsky, and R. E. Stencel. 1 Jun 82, 24p
Grants NAS5-82, NGL-06-003-057
Pub. in Astrophysical Jnl. 257, n1 p225-246, 1 Jun 82.

The authors tested the hypothesis originally proposed by Linsky and Haisch that a boundary exists in the H-R diagram separating yellow giants (V - R approximately equal or < 0.80), which typically show evidence of 100,000 K plasma in their outer atmospheres, from red giants and supergiants (V - R > 0.80), which typically show little or no evidence of any plasma hotter than 10,000 K. They present and discuss IUE 1150-2000 A low-resolution spectra of 39 late-type stars of luminosity classes I-IV.

4.
ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A118 481/1 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
AFGL Geomagnetism Workshop,
Paul Fougere, Howard Singer, and W. Jeffrey Hughes. 1982, 3p Rept no. AFGL-TR-82-0210
Pub. in EOS, v63 n24 p540-541, 15 Jun 82.

No abstract available.

AD-A118 543/8 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.

Magnetosphere-Ionosphere Coupling: Contributions from IMS Satellite Observations.
William J. Burke. 29 Jan 82, 25p Rept no. AFGL-TR-82-0221
Pub. in Reviews of Geophysics and Space Physics, v20 n3 p685-708 Aug 82.

No abstract available.

AD-A118 578/4 PC **A02**/MF **A01**
Kansas Univ., Lawrence. Dept. of Chemistry.
Laboratory Studies of Solvated Gas-Phase Anions.
Final scientific rept. 1 Mar 81-28 Feb 82,
Peter M. Hierl. Feb 82, 9p AFOSR-TR-82-0660
Grant AFOSR-81-0105

Cross sections are reported for the reactions of the solvated anions OH-(H2O) with CO2 and SO2 over the range of reactant translational energy 0.n15-25.0 eV (LAB). Reactions observed include solvent switching, collisional dissociation, and charge transfer. These reactions are particularly important to the ion chemistry of the earth's atmosphere below 80 km, where considerable hydration of negative ions has been observed. (Author)

AD-A118 580/0 PC **A02**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Magnetic Dipole Infrared Atmospheric Oxygen Bands.
Laurence S. Rothman. 1 Mar 82, 5p Rept no. AFGL-TR-82-0232
Pub. in Applied Optics, v21 n13 p2428-2431, 1 Jul 82.

No abstract available.

AD-A118 715/2 PC **A06**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Cirrus Particle Distribution Study. Part 8.
Final scientific rept.,
Ian D. Cohen. 28 Oct 81, 107p Rept nos. AFGL-TR-81-0316-PT-8, AFGL-AFSG-437-PT-8
See also part 7, AD-A100 269.

The AFGL instrumented MC-130E sampled thin cirrus clouds on 3,4, and 5 February 1979. In some cases, there was no visible cirrus, but some particles were detected. During this period, the upper air pattern was dominated by southwest to northeast flow, while two surface systems moved from north to south. The first of these left thin cirrus in eastern New Mexico; the second pushed south to the Gulf of Mexico, leaving the cirrus studied on the previous two flights. Most of the particles observed were less than 100 microns. As a rule, the opacity of the cirrus seemed related more closely to the density of particles in the 20- to 200-micro range. On examination the form factor appeared to be higher (indicating more consistent sized particles) in cirrus of nonfrontal origin than in cirrus associated with strong surface weather systems. This report is the last in a series of cirrus particle distribution studies.

AD-A118 723/6 PC **A02**/MF **A01**
Aerospace Corp., El Segundo, CA. Engineering Science Operations.
Atmospheric Density Models, Including Tides.
Final rept. 28 Mar 79-28 Mar 82,
Jeffrey M. Forbes. 31 Mar 82, 17p AFGL-TR-82-0119
Contract F19628-79-C-0088

A numerical model has been developed to solve the lineraized atmospheric tidal equations for diurnal and semidiurnal temperatures and the 3 velocity components of the wind field from the surface to the upper thermosphere (Ca. 400km). Density, pressure, and composition variations can be computed from a simple auxiliary set of equations. Extensive tables and figures have been compiled for potential users. Validity of the model has been verified by comparison with various rocket and satellite data.

AD-A118 734/3 PC **A03**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
The Statistical Relations Among Q, Kp, and the Global Weather Central -K Indices.
Environmental research papers,
B. S. Dandekar. 13 Jan 82, 32p Rept nos. AFGL-TR-82-0010, AFGL-ERP-763

The K index determined by the Air Force Global Weather Central has been compared with Kp and Q (from Sodankyla) for the period March 1978 - May 1981 to determine empirical relations between Kp vs K, Q vs Kp, and Q vs K. The study shows that the K index is a reasonably good measure of Kp during most of the time. The time-dependent relations between Q and K, and Kp and K are derived, so that one can convert the K (AFGWC) index to the Kp or Q index for specification of the auroral ionosphere in the Experimental Radar System test region.

AD-A118 775/6 PC **A04**/MF **A01**
Systems and Applied Sciences Corp., Riverdale, MD.
Solar Radiative Flux Calculations from Standard Surface Meteorological Observations.
Ralph Shapiro. 1 Mar 82, 55p SCIENTIFIC-1, AFGL-TR-82-0039
Contract F19628-81-C-0042

The flux of solar radiation through a model atmosphere composed of n layers and a ground surface is represented by a system of 2n+2 linear equations. The system is solved in closed form explicitly for the radiation reaching the ground and the radiation reflected back to space, as a function of the vertically incident radiation and specified reflection and transmission coefficients for each of the n layers and the ground. These coefficients vary in time and space as functions of a wide variety of parameters. However, they are primarily dependent upon cloud amount and cloud thickness or type. In spite of some past measurement programs, the cloud coefficients are not very well known. Making use of direct observations of the total solar radiation reaching the ground and simultaneous cloud observations, the model offers the opportunity for determining the mean transmission and reflection characteristics of any individual cloud type. The model is flexible with regard to the number of layers chosen to represent the atmosphere and with regard to the sophistication of the physics to be incorporated. With the use of the SOLMET data tapes, a first approximation calculation is described for the reflection, transmission, and absorption coefficients for a three-layer atmosphere containing high, middle, and low cloud types. Once these coefficients have been determined, the flux of solar radiation is calculated from routine surface meteorological observations. A test of the model on independent data shows no loss in accuracy as compared with that obtained with the developmental data sample. (Author)

AD-A118 844/0 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
On the Prospects for Artificially Inducing Equatorial Spread F.
Interim rept.,
S. T. Zalesak, and S. L. Ossakow. 9 Sep 82, 30p
Rept no. NRL-MR-4899

The possibility of artificially inducing the onset of equatorial spread F by the collision dominated Rayleigh-Taylor or ExB gradient drift instability mechanism via a hypothetical chemical release in the equatorial ionosphere is considered. Each of the factors affecting the outcome of such an experiment is examined, and recommendations are made with the goal of maximizing the chances of successfully triggering the instabilities. (Author)

DE82011990 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Comparison of the Los Alamos Visibility Model's Predictions with Measurements.
M. D. Williams, and D. H. Nochumson. 1982, 16p LA-UR-82-701, CONF-820627-1
Contract W-7405-ENG-36
75. annual meeting on the Air Pollution Control Association, New Orleans, LA, USA, 20 Jun 1982.

The radiative transfer component of the model appears to perform well. However, horizontal dispersion is underestimated during light wind stable conditions. The result is an underestimation of the effects of nitrogen dioxide. Light scattering appears to have been over-estimated, probably related to uncertainties in the emission rates and size distribution of fly ash. One of the strengths of the model should be its point-by-point calculation of nitrogen dioxide, however poor dispersion characterization may limit its importance. A much larger data base with less uncertainties would provide a more comprehensive model validation. It would be useful to examine in detail the dispersion module and compare its predictions to those measured in the aircraft sampling program. Some of these programs also have measurements of NO sub 2 and NO/sub x/, which would permit a more detailed examination of the performance of the chemistry module.

DE82012492 PC **A05**/MF **A01**
Lawrence Livermore National Lab., CA.
Program Report for FY 1981. Atmospheric and Geophysical Sciences Division of the Physics Department.
J. B. Knox, M. C. MacCracken, M. H. Dickerson, P. M. Gresho, and F. M. Luther. Feb 82, 86p UCRL-51444-81
Contract W-7405-ENG-48
Microfiche only after original copies are exhausted.

The goals, highlights, and achievements of the FY 1981 research program as conducted by the Atmospheric and Geophysical Sciences Division (G-Division) and supporting segments of the Lawrence Livermore National Laboratory (LLNL) are summarized briefly. The research, as well as the division staff, are organized into five research themes: advanced modeling, regional modeling and assessments, CO sub 2 and climate research, stratospheric research, and special projects. Summaries are included of the Atmospheric and Geophysical Sciences Program, staff, and publications for FY 1981. An annotated bibliography of unique analytical and numerical modeling capabilities in use and under development is included for reference.

N82-29792/0 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Latitudinal and Magnetic Flux Tube Extension of the Equatorial Spread F Irregularities.
M. A. Abdu, R. T. Demedeiros, and Y. Nakamura.
Mar 82, 25p INPE-2343-PRE/087
Submitted for Publication.

The spread F occurrence characteristics at the magnetic equatorial station, Fortaleza (4 S, 38 W, dip latitude 1.8 S) and the low latitude station, Cachoeira Paulista (22 S, 45 W, dip latitude 14 S) located with a relatively small longitudinal difference, in Brazil are compared. The results show strong correlation between the occurrences of spread F events at the two stations for most of the time. While all the spread F events over Cachoeira Paulista are accompanied by such events over Fortaleza, the converse is not true. Also the spread F onset times over the equator are systematically earlier than over the low latitude. Although the spread F durations at the two stations are approximately linearly related, an event over Cachoeira Paulista is observed only for those that have durations more than 4 to 5 hours over Fortaleza. Possible implications of these results on the plasma bubble rise velocities in the equatorial ionosphere are discussed.

N82-29793/8 PC **A02**/MF **A01**
Science Systems and Applications, Inc., Seabrook, MD.
Ozone Uncertainties Study Algorithm (OUSA).
Final Technical Report.
O. P. Bahethi. 1982, 24p NASA-CR-166818, NAS 1.26:166818
Contract NAS5-26083

An algorithm to carry out sensitivities, uncertainties and overall imprecision studies to a set of input parameters for a one dimensional steady ozone photochemistry model is described. This algorithm can be used to evaluate steady state perturbations due to point source or distributed ejection of H2O, CLX, and NOx, besides, varying the incident solar flux. This algorithm is operational on IBM OS/360-91 computer at NASA/Goddard Space Flight Center's Science and Applications Computer Center (SACC).

N82-29794/6 PC **A03**/MF **A01**
Old Dominion Univ., Norfolk, VA.
Measurements of the Global Distribution of Carbon Monoxide in the Troposphere.
R. R. Hinton. Jul 82, 44p NASA-CR-169161, NAS 1.26:169161
Contract NCC1-2

Carbon monoxide and methane grab samples were obtained simultaneously with ozone, aerosol, nitric oxide and DACOM CO measurements. Eighty grab samples were collected at various altitudes up to 19,000 ft. along a north-south flight path from Wallops Flight Center, VA to 11 N. CO and CH were analyzed by flame ionization gas chromatography with cryogenic preconcentration. The relationship between CO and O3 concentrated is examined. A comparative analysis

between trends in aerosol and CO concentration is performed.

N82-29796/1 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Applying Modeling Results in Designing a Global Tropospheric Experiment.
Jul 82, 95p NASA-CP-2235, L-15383
Presented at a Working Group Meeting, Virginia Beach, VA., 15-16 Jul. 1981.

A set of field experiments and advanced modeling studies which provide a strategy for a program of global tropospheric experiments was identified. An expanded effort to develop space applications for tropospheric air quality monitoring and studies was recommended. The tropospheric ozone, carbon, nitrogen, and sulfur cycles are addressed. Stratospheric-tropospheric exchange is discussed. Fast photochemical processes in the free troposphere are considered.

N82-29797/9 PC **A12**/MF **A01**
Illinois Univ. at Urbana-Champaign. Aeronomy Lab.
The Transport of Nitric Oxide in the Upper Atmosphere by Planetary Waves and the Zonal Mean Circulation.
G. A. Jones, and S. K. Avery. 1 Jun 82, 268p NASA-CR-169214, NAS 1.26:169214
Grant NSG-7507, Contract NGR-14-005-181

A time-dependent numerical model was developed and used to study the interaction between planetary waves, the zonal mean circulation, and the trace constituent nitric oxide in the region between 55 km and 120 km. The factors which contribute to the structure of the nitric oxide distribution were examined, and the sensitivity of the distribution to changes in planetary wave amplitude was investigated. Wave-induced changes in the mean nitric oxide concentration were examined as a possible mechanism for the observed winter anomaly. Results indicate that vertically-propagating planetary waves induce a wave-like structure in the nitric oxide distribution and that at certain levels, transports of nitric oxide by planetary waves could significantly affect the mean nitric oxide distribution. The magnitude and direction of these transports at a given level was found to depend not only on the amplitude of the planetary wave, but also on the loss rate of nitric oxide at that level.

N82-29798/7 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Equatorial Ozone Characteristics as Measured at Natal (5.9 Deg S, 35.2 Deg W).
V. W. J. H. Kirchhoff, E. Hilsenrath, A. G. Motta, Y. Sahai, and R. A. Medrano-b. Apr 82, 30p NASA-TM-84716, NAS 1.15:84716
Prepared in Cooperation with Instituto de Pesquisas Espaciais Submitted for Publication.

Ozone density profiles obtained through electrochemical concentration cell (ECC) sonde measurements at Natal were analyzed. Time variations, as expected, are small. Outstanding features of the data are tropospheric densities substantially higher than those measured at other stations, and also a total ozone content that is higher than the averages given by satellite measurements.

N82-29799/5 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Vertical Ionization Drift Velocities and Range Type Spread F in the Evening Equatorial Ionosphere.
M. A. Abdu, R. T. Demedeiros, J. A. Bittencourt, and I. S. Batista. Feb 82, 14p INPE-2332-PRE/081
Submitted for Publication.

Range type spread F indices in the post sunset hours, determined from ionograms, are compared with F layer vertical velocities, also deduced from ionograms, for a period of one year, over the magnetic equatorial station Fortaleza (geographic coordinates: 4 S, 38 W; dip latitude: 1.8 S), Brazil. Besides good correlation between the two parameters, the results suggest the presence of a certain threshold value for the vertical ionization velocity and a corresponding threshold height for the base of the evening F layer, as one of the necessary conditions for the occurrence of spread F irregularities. The nature of the possible variabilities in the amplitude of the initial perturbation in the ionization, which is another prerequisite for the generation of irregularities, is discussed briefly.

N82-29826/6 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
User's Guide for the Solar Backscattered Ultraviolet (SBUV) Instrument First Year Ozone-S Data Set.
A. J. Fleig, K. F. Klenk, P. K. Bhartia, D. Gordon, and W. H. Schneider. Jun 82, 69p NASA-RP-1095, REPT-82FO136
Contract NAS5-26753
Prepared in Cooperation with Systems and Applied Sciences Corp., Bladensburg, MD.

Total-ozone and ozone vertical profile results for Solar Backscattered Ultraviolet/Total Ozone Mapping Spectrometer (SBUV/TOMS) Nimbus 7 operation from November 1978 to November 1979 are available. The algorithm used have been thoroughly tested, the instrument performance has been examined in detail, and the ozone results have been compared with Dobson, Umkehr, balloon, and rocket observations. The accuracy and precision of the satellite ozone data are good to at least within the ability of the ground truth to check and are self-consistent to within the specifications of the instrument. The 'SBUV User's Guide' describes the SBUV experiment and algorithms used. Detailed information on the data available on computer tape is provided including how to order tapes from the National Space Science Data Center.

4B. Meteorology

AD-A118 448/0 PC **A13**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: North America.
Data summary.
May 82, 291p USAFETAC/DS-81/054, SBI-AD-E850 185
Supersedes Rept. no. USAFETAC/DS-79/088, AD-A082 092.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy); and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 449/8 PC **A03**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: Latin America.
Data summary.
May 82, 30p USAFETAC/DS-81/055, SBI-AD-E850 186
Supersedes Rept. no. USAFETAC/DS-79/089, AD-A082 093.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy); and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 450/6 PC **A09**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: Europe.
Data summary.
May 82, 188p USAFETAC/DS-/81/056, SBI-AD-E850 187
Supersedes Rept. no. USAFETAC/DS-79/090, AD-A082 094.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy); and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 451/4 PC **A02**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: USSR and Mongolian PR.
Data summary.
May 82, 8p USAFETAC/DS-81/057, SBI-AD-E850 188
Supersedes Rept. no. USAFETAC/DS-79/091, AD-A082 095.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy); and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 452/2 PC **A02**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: Africa.
Data summary.
May 82, 16p USAFETAC/DS-81/059, SBI-AD-E850 189
Supersedes Rept. no. USAFETAC/DS-79/093, AD-A082 097.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy); and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 453/0 PC **A03**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: Antarctica, Australia, and Oceania.
Data summary.

May 82, 42p USAFETAC/DS-81/060, SBI-AD-E850 190
Supersedes Rept. no. USAFETAC/DS-79/094, AD-A082 098.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy); and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 454/8 PC **A09**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Air Weather Service (AWS) Climatic Briefs: Asia. Data Summary.
May 82, 191p USAFETAC/DS-81/058, SBI-AD-E850 191
Supersedes Rept. no. USAFETAC/DS-79/092, AD-A082 096.

The AWS Climatic Briefs provide summarized monthly and annual climatic data for specific locations. Different data summaries provide the information for different geographical areas. These areas are: North America (including Greenland and Bermuda); Latin America (including Mexico, West Indies, and dependent islands): Europe (including North Atlantic islands); USSR and Mongolian Peoples Republic; Peoples Republic of China (no Climatic Briefs at this time); Asia (Turkey and Cyprus to Indonesia and Japan); Africa (including Malagasy);and Antarctica, Australia, and Oceania. Meteorological elements included are: temperature, precipitation, relative humidity, vapor pressure, dew point, pressure altitude, surface wind, mean cloud cover, thunderstorm and fog days, flying weather, and typhoon and hurricane data.

AD-A118 461/3 PC **A19**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Mather AFB, California. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
4 Jun 82, 442p USAFETAC/DS-82/033, SBI-AD-E850 192
Supersedes Rept. no. USAFETAC/DS-79/007, AD-A069 236. Information contact: USAFETAC/TS, Scott AFB, IL 62225.

This report is a six part statistical summary of surface weather observations for Mather AFB, California. It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet bulb and dew point temperature and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 462/1 PC **A20**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Fort Knox/Godman AAF, Kentucky. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
13 Jul 82, 463p USAFETAC/DS-82/042, SBI-AD-E850 201
Supersedes Rept. no. USAFETAC/DS-79/025, AD-A072 036. Information contact: USAFETAC/TS, Scott AFB, IL 62225.

This report is a six-part statistical summary of surface weather observations for Fort Knox/Godman AAF, Kentucky. It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (C) Surface winds; (D) Ceiling versus Visibility; Sky cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperature and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 471/2 PC **A20**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Albany County APT, New York. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
14 Jun 82, 470p USAFETAC/DS-82/036, SBI-AD-E850 195

This report is a six-part statistical summary of surface weather observations for Albany County APT, New York. It contains the following parts: (A) Weather Conditions; Atmospheric Phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 472/0 PC **A19**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Osan AB, Korea. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
14 Jun 82, 431p USAFETAC/DS-82/035, SBI-AD-E850 194
Supersedes Rept. no. USAFETAC/DS-78/007, AD-A061 831. Information contact: USAFETAC/TS, Scott AFB, IL 62225.

This report is a six-part statistical summary of surface weather observations for Osan AB, Korea. It contains the following parts: (A) Weather Conditions; Atmospheric Phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 505/7 PC **A22**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Daggett Municipal, California. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
2 Jul 82, 515p USAFETAC/DS-82/040, SBI-AD-E850 199

This report is a six part statistical summary of surface weather observations for Daggett Municipal, California. It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 506/5 PC **A20**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Natrona County/Casper, Wyoming. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
16 Jul 82, 453p USAFETAC/DS-82/041, SBI-AD-E850 200

This report is a six part statistical summary of surface weather observations for Natrona Co/Casper, Wyoming. It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values; (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 507/3 PC **A17**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Bitburg Air Base, West Germany. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
29 Jun 82, 400p USAFETAC/DS-82/039, SBI-AD-E850 198

This report is a six part statistical summary of surface weather observations for Bitburg AB, West Germany. It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values; (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 508/1 PC **A19**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Seattle Tacoma IAP, Washington. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
21 Jun 82, 450p USAFETAC/DS-82/038, SBI-AD-E850 197

This report is a six-part statistical summary of surface weather observations for Seattle/Tacoma IAP, Washington It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values; (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperature and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station

pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 509/9 PC **A21**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Youngstown MAP, Ohio. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
10 May 82, 485p USAFETAC/DS-82/034, SBI-AD-E850 193

This report is a six part statistical summary of surface weather observations for Youngstown MAP, Ohio. It contains the following parts: (A) Weather conditions; Atmospheric phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values; (C) Surface Winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 510/7 PC **A21**/MF **A01**
Air Force Environmental Technical Applications Center, Scott AFB, IL.
Wurtsmith AFB, Michigan. Revised Uniform Summary of Surface Weather Observations (RUSSWO). Parts A-F.
Final rept.
17 Jun 82, 486p USAFETAC/DS-82/037, SBI-AD-E850 196
Supersedes Rept. no. USAFETAC/DS-78-010, AD-A061 834.

This report is a six-part statistical summary of surface weather observations for Wurtsmith AFB, Michigan. It contains the following parts: (A) Weather conditions; Atmospheric Phenomena; (B) Precipitation, Snowfall and Snow Depth (daily amounts and extreme values); (C) Surface winds; (D) Ceiling versus Visibility; Sky Cover; (E) Psychrometric Summaries (daily maximum and minimum temperatures, extreme maximum and minimum temperatures, psychrometric summary of wet-bulb temperature depression versus dry-bulb temperature, means and standard deviations of dry-bulb, wet-bulb and dew point temperatures and relative humidity); and (F) Pressure Summary (means, standard, deviations, and observation counts of station pressure and sea-level pressure). Data in this report are presented in tabular form, in most cases in percentage frequency of occurrence or cumulative percentage frequency of occurring tables.

AD-A118 639/4 Not available NTIS
Hawaii Inst. of Geophysics, Honolulu.
Fog Inception in Strong Salt-Laden Marine Winds,
Alfred H. Woodcock. 4 Mar 81, 8p Rept no. HIG-CONTRIB-12000
Availability: Pub. in Tellus, v34 n2 p127-134 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 646/9 Not available NTIS
Hawaii Inst. of Geophysics, Honolulu.
Fog and Tidal Current Connection at Cape Cod Canal - Early Recognition and Recent Measurements,
Alfred H. Woodcock. 1981, 6p Rept no. HIG-CONTRIB-1212
Availability: Pub. in Bulletin of the American Meteorological Society, v63 n2 p161-166 Feb 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 648/5 Not available NTIS
Hawaii Inst. of Geophysics, Honolulu.
Marine Fog Droplets and Salt Nuclei. Part II,
Alfred H. Woodcock, Duncan C. Blanchard, and James E. Jiusto. 20 May 80, 12p
Availability: Pub. in Jnl. of the Atmospheric Sciences, v38 n1 p129-140 Jan 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 735/0 PC **A03**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
The B-G System of Evaluating Forecasts.
Environmental research papers,
Irving I. Gringorten, and Albert R. Boehm. 4 Jan 82, 33p Rept nos. AFGL-TR-82-0006, AFGL-ERP-761

To score a forecast of an event, like the noontime temperature at a city airport, a system has been proposed that would measure the improvement of the forecast over simple climatic information. If the climatic probability of the forecast (F) is PF, and that of the observed event (V) is PV, then the assigned score (sFV) becomes sFV = -ln(1 - P1)P2 - 1, where P1 = min(PF, PV) and P2 = max(PF, PV). A test of the forecaster's skill, however, requires a large set of forecasts and corresponding verifications.

AD-A118 740/0 PC **A03**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Sonde Experiments for Comparative Measurements of Optical Turbulence.
Instrumentation papers,
J. H. Brown, R. E. Good, P. M. Bench, and G. Faucher. 24 Feb 82, 49p Rept nos. AFGL-TR-82-0079, AFGL-IP-310

Five different instruments were used in multiple experiments to measure atmospheric turbulence in the form of the refractive structure constant, C sub n squared. These included UHF radar, optical scintillometer, modified radiosondes, AFGL thermosondes, and aircraft micro-thermal measurements. Described here are the radiosonde and thermosonde electronics and their calibrations. The data reduction scheme is described and a brief program description is given. Although the different instruments gave measurements somewhat separated in space and time, first results show good agreement between the radar, scintillometer, and thermosonde measurements. (Author)

AD-A118 744/2 PC **A09**/MF **A01**
Systems and Applied Sciences Corp., Riverdale, MD.
Technique Development for Weather Forecasting.
Final rept. 1 Dec 80-30 Nov 81,
Alan M. Gerlach. 30 Nov 81, 190p AFGL-TR-82-0020
Contract F19628-81-C-0039

This report summarizes weather research conducted by SASC in several technical areas: in numerical weather prediction, investigation of the physical and spectral characteristics of global moisture, distribution, and examination of the generation of harmonics for analysis of meteorological data in the vertical and horizontal; development of McIDAS-based interactive aids for formulating mesoscale forecasts; development of specialized computer programs for sensor and technique evaluation; in satellite meteorology, interactive adaptation of a clustering technique for image analysis, and test of curves relating cloud over and average reflectivity; in weather radar, development of a single-Doppler with retrieval technique, real-time conversion of a storm cell detection and tracking technique, and studies of turbulence structures. In addition, the maintenance, enhancement, and use of McIDAS are described. (Author)

AD-A118 751/7 PC **A05**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Improved Cloud Detection Utilizing Defense Meteorological Satellite Program near Infrared Measurements.
Environmental research papers,
James T. Bunting, and Robert P. d'Entremont. 27 Jan 82, 93p Rept nos. AFGL-TR-82-0027, AFGL-ERP-765

Six different automated classifiers, three of which were suggested by previous studies, were tested on a special data base of DMSP SSC (near IR channel, 1.51 to 1.63 micrometers) and OLS (visible channel, 0.4 to 1.0 micrometers, and IR channel, 10.2 to 12.8 micrometers). The classifiers were used to distinguish water clouds, ice clouds, snow cover, and other cloud-free surfaces. A test sample of 433 known cases was found with the aid of the AFGL Man-Computer Interactive Data Access System. (Author)

AD-A118 753/3 PC **A03**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Climatic Probabilities of the Vertical Distribution of Cloud Cover.
Environmental research papers,
Irving I. Gringorten. 24 Feb 82, 50p Rept nos. AFGL-TR-82-0078, AFGL-ERP-773

The probability model of areal coverage of weather conditions that was published in the Journal of Applied Meteorology (1979) is applied to extend the usefulness of climatic records of station sky cover (tenths) and ceiling height (meters) to the estimation of cloud presence at any level in the atmosphere or within any layer. Specifically, estimates are made of: (a) the average cloud cover as a function of the vertical distance above the ground, (b) the average amount of cloud presence, in layers or at individual levels, and (c) the probability distribution of cloud cover, from clear to overcast, at any level or in any layer between two levels. (Author)

AD-A118 766/5 PC **A04**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
A Climatological Study of the AFGL Mesonetwork. Volume I.
Final scientific rept.,
H. Albert Brown. 11 Jan 82, 61p Rept nos. AFGL-TR-82-0011(1), AFGL-ERP-764-VOL-1
See also Volume 2, AD-A116 962.

This study represents the first step in the development and analysis of an edited mesoclimatological data base of four years of observations by the 26 automated weather stations of the AFGL Mesonetwork. The first section describes the station network that existed during the period of operation, September 1972 through July 1976; the weather instruments that were utilized in the network; and the methodology of the data-editing routine. In the final section, the climatology derived from one year of data for half of the stations is presented. Selection of stations was based on topographic features or location in the network. Sites represented are located at towers, runways, swamps, valleys, hills and, finally, at the coast line.

AD-A118 774/9 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Aerophysics Lab.
Development of an Airborne Sonic Thermometer.
Final rept. 1 Jul 80-30 Sep 82,
Tore R. Christiansen. Sep 82, 122p AFGL-TR-82-0179
Contract F19628-80-K-0089

An airborne sonic thermometer has been developed and is now ready for flight testing. The designed instrument uses a specially developed electromagnetic transmitter, a sensitive condenser microphone and integrated circuit components. The air temperature is determined by measuring the phase difference between the transmitted and received signals across an acoustic path in the medium. The phase information is delivered as a changing dc-level voltage, as a digital signal and in the form of two phase shifted squarewaves. Improvements of the present design are needed to exclude the effect of wind speed on the temperature measurement, and in the accuracy of the calibration of the signal outputs. Once these are included, however, temperature measurements to an accuracy of plus minus one tenth of a degree centrigrade, over a temperature range from plus 25 C to minus 80 C, should be available. (Author)

AD-A118 836/6 PC **A03**/MF **A01**
Science Applications, Inc., McLean, VA.
Numerical Modeling of Tropical Weather Systems.
Final rept. 13 Apr 81-12 Jun 82,
Simon Chang. Aug 82, 47p
Contract N00014-81-C-2224

This final report documents the efforts on numerical simulations of tropical weather systems. Tropical weather systems investigated include the Indian Ocean monsoon depressions, tropical cyclones, and easterly waves.

DE82008244 MF **A01**
Lawrence Livermore National Lab., CA.

Finite-Element Model for Environmental Problems Involving Complex Terrain.
R. L. Lee, J. M. Leone, Jr., P. M. Gresho, and S. T. Chan. Feb 82, 9p UCRL-86586, CONF-820702-2
Contract W-7405-ENG-48
International symposium on finite element methods in flow problems, Tokyo, Japan, 26 Jul 1982.
Available in microfiche only.

The objective is to develop advanced models capable of predicting wind fields, with observations used only for initial and boundary conditions. This paper briefly describes the planetary boundary layer (PBL) model and presents preliminary numerical examples related to the initialization of PBL flow over complex terrain. (ERA citation 07:047978)

DE82013257 PC **A02**/MF **A01**
Increased CO sub 2 Concentration in the Atmosphere and Climate Change: Potential Effects on the Greenland Ice Sheet.
W. Ambach. 1980, 11p UCRL-Trans-11767
Contract W-7405-ENG-48
A , Wetter Leben, 32 n3 P135-142 1980.Portions of document are illegible.

Conclusions based on measurements of the heat balance and the net ablation across an altitude profile of the Greenland ice sheet show that considerable changes of the mass balance of the Greenland ice sheet may occur due to climatic warming. A temperature increase of no more than 1.5 exp 0 C will cause a decisive change in mass balance. This result is of interest in connection with an intensified greenhouse effect of the atmosphere affected by higher atmospheric CO sub 2 concentrations.

DE82015044 PC **A02**/MF **A01**
Geological Survey, Knoxville, TN.
Precipitation Data for Burial Grounds 5 and 6, Oak Ridge National Laboratory, Tennessee, 1976-1980.
D. A. Webster, J. S. Beatty, P. M. Benjamin, and W. M. Tranum. 1982, 19p USGS-OFR-82-254
Contract W-7405-ENG-26

As part of a hydrogeologic investigation, precipitation data were collected at two stations, one each in Burial Grounds 5 and 6 at the Oak Ridge National Laboratory, Tennessee. Daily, monthly, and annual values are reported herein for the period from January 1976 through December 1980. During this period, annual values ranged from about 25% above to about 25% below the calculated mean of 51.96 inches at Burial Ground 5 and 49.60 inches at Burial Ground 6.

DE82016223 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Basic Probability Characteristics of Wind-Direction Fluctuations.
D. C. Powell. May 82, 91p PNL-4186
Contract AC06-76RL01830
Portions of document are illegible.
Microfiche only after original copies are exhausted.

A probability model is developed for the projection of wind direction fluctuations in the horizontal plane, applicable at heights of concern in Wind Energy Conversion Systems (WECS) operations. The model is given as exceedance probability. The textual development shows that such a model must include a model for the unstable boundary layer. The model includes a probability function for the rms direction variance sigma/ sub theta/ taken from a series of 44 tests conducted by the Air Force Cambridge Laboratory in Kansas in 1968. Tests with wind speeds below typical WECS cut-in speed were excluded from this sample. The model also includes a slight adjustment for small departure of the probability of theta from Gaussian. The model is expressed in a code which may be run according to either of two options. At either option the program reads in two angles for which exceedance probability is computed. Additionally, the probability that the wind direction will be between these two angles is given by the difference between the two exceedance probabilities. At the first option the program produces the exceedance probabilities and sector probability just described. At the second option the program goes beyond the stated atmospheric model in the following respects. Firstly, a user-specified bandpass filter is invoked that corresponds to the frequency range of machine sensitivity to wind fluctuation frequencies. The values of sigma/sub theta/ in the probability function from the Kansas data are reduced accordingly using lateral component turbulence spectra for neutral and unstable conditions. The output exceedance probabilities calculated correspond to the reduced values. Secondly, the program produces frequency of outward slope level-crossings at the two angles specified and the average time interval between such a crossiong ano the return of wind direction to the same level (angle). This information maybe used in yaw and operating strategies.

NUREG/CR-2860 PC **A05**/MF **A01**
Florida Univ., Gainesville. Coastal and Oceanographic Engineering Lab.
Storm Surge Measurements and Computations for Hurricane David,
Gary Howell, D. Y. Lee, and H. Wang. Aug 82, 80p UFL/COEL-82/005

One of the objectives of the Coastal Data Network System established and maintained by the Coastal and Oceanographic Engineering Laboratory at the University of Florida is to acquire and document storm surge data along the Florida Coast. Since the establishment of the system only one major hurricane resulted in storm surge of significance. This was Hurricane David which swept through the lower part of Florida's east coast in September 1979. Storm surge data were obtained at Miami Beach, Palm Beach and Vero Beach. These date were analyzed and documented. In addition, the numerical storm surge model was used to compute the storm surges at Palm Beach and Vero Beach to facilitate comparisons.

N82-29827/4 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Atmospheric Observations for STS-3 Landing.
R. E. Turner, J. E. Arnold, G. S. Wilson, and W. Batts. Jun 82, 31p NASA-TM-82481, NAS 1.15:82481

Synoptic weather conditions existing over the western United States for the time of Shuttle descent are presented. The techniques and methods used to furnish synoptic atmospheric data at the surface and aloft for flight verification of the STS 3 orbiter during its descent are specified. Examples of the upper level data set are given.

N82-29828/2 PC **A04**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
A 2 1/2 Dimensional Model for Numerical Weather Prediction over Brazil.
C. M. Dixit, and W. Boruszewski. Feb 82, 56p INPE-2317-PRE/076
Presented at the I Congresso Brasileiro de Meteorologia, Compina Grande, Sep. 1980.

A 2 1/2 dimensional model for numerical weather prediction over Brazil using a limited amount of data is described and compared to a quasi-geostrophic model in the advantages it offers. The model accepts as input winds at 2 levels (300 mb and 700 mb) together with boundary values of the geopotentials at the same levels over a limited area. It proceeds to give a short range forecast for the winds (including the divergent components) at 300 and 700 mb together with the vertical velocity field at the 500 mb level. Two cases (one with 3 consecutive days of data and the other with 2 consecutive days of data) were integrated to test the functioning of the model. The results of the 24 h and 48 h forecast comparison, both from the synoptic point of view and from a numerical point of view, are presented at the end of the work together with figures giving the forecast stream functions.

N82-29829/0 PC **A03**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Interannual and Seasonal Variation in the Energetics of the Atmosphere over Northeast Brazil.
V. S. Marques, V. B. Rao, and L. C. B. Molion. Mar 82, 47p INPE-2358-PRE/094
Submitted for Publication.

Interannual and seasonal variations of energetics over Northeast Brazil are discussed. A cylindrical boundary having 11 aerological stations was studied. Mass and energy fluxes are evaluated for the dry and wet seasons and also for the dry and wet years. During the wet period there is inward mass flux in the lower levels and outward mass flux in the upper levels. During the dry period there is inward mass flux in the middle levels with outward mass flux above and below. Variations in the vertical profiles of the energy parameters suggest that the rainfall variations in the NE Brazil are not of local origin but are connected to the variations of the general circulation in the tropics. Water vapor flux calculations showed that during the wet period there is a net import of water vapor and during the dry period there is a net export.

N82-29830/8 PC **A04**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Precursors of Two Severe Freezes in Brazil.
M. A. Fortune, and V. E. Kousky. Mar 82, 51p INPE-2342-PRE/086
Submitted for Publication.

Two freezes with repercussions on world coffee markets struck Brazil. Data from satellites and buoys were analyzed for early warning signs of a freeze. Two important precursors were found: (1) slowly moving long wave pattern in the central South Pacific Ocean amplified greatly two days before frontogenesis in South America and four to five days before the freezes in Brazil, and (2) the long wave ridge, when at maximum amplitude, was located near the southern Andes, and the next long wave trough downstream was located in the South Atlantic at the longitude of Brazil. This configuration channelled subantarctic air northward entirely over land into subtropical latitudes. The long waves amplified, but the northern portion of the Atlantic trough became cutoff. With the passage of the cold core cutoff vortex through Brazil three days later, freezing temperatures struck a large swath north of the Tropic of Capricorn where a freeze is rare.

N82-29831/6 PC **A03**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
A Study of Meteorological Time Series. Part 3: The Seasonal Cycle.
V. E. Kousky, and S. Srivatsangam. Mar 82, 28p INPE-2349-PRE/090
Submitted for Publication.

The annual cycle and its first three harmonics were extracted from the series as a seasonal cycle. The distributions of the annual and seasonal cycles were studied for the United States and its immediate surroundings. The results show that the annual and seasonal cycles are extremely important contributors to the observed temperature and wind fields throughout the troposphere. In winter, the annual cycle establishes a west wind maximum in the subtropics, quite akin to the winter average jet stream. The annual cycle in the horizontal wind constitutes a trough over the central parts of the United States in winter and a ridge in the same area in summer. A possible reason for the relative weakness of the seasonal cycle in the meridional component of the wind, compared to that in the zonal component, is deduced to be Rossby wave propagation.

N82-29832/4 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Generation of Subsynoptic Unstable Baroclinic Waves by Surface Friction.
P. Satyamurty. Mar 82, 15p INPE-2353-PRE/092
Submitted for Publication.

Inclusion of surface drag produces an additional growth rate peak at L sub x approximately 1000 km, even if the curvature of the basic zonal wind profile is not favorable and diabatic heating due to the liberation of latent heat not allowed for. The growth rate of this most unstable intermediate scale wave increases with surface drag and decreases with internal friction. This wave has amplitude maxima near the surface and at about 1.5 km. A uniform friction at all depths does not produce a second growth rate peak, but reduces the growth rate of the Eady mode.

PB82-261348 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
Atmospheric Boundary Layer Simulation in a Wind Tunnel, Using Air Injection,
T. J. Sluman, H. R. E. van Maanen, and G. Ooms. Apr 81, 30p MEAH-7

The inner part of a neutral atmospheric boundary layer has been simulated in a wind tunnel, using air injection through the wind tunnel floor to thicken the boundary layer. The flow over both a rural area and an urban area has been simulated by adapting the roughness of the wind tunnel floor. Due to the thickening of the

boundary layer the scaling factor of atmospheric boundary layer simulation with air injection is considerably smaller than that without air injection. This reduction of the scaling factor is very important for the simulation of atmospheric dispersion problems in a wind tunnel.

PB82-265711 Not available NTIS
National Bureau of Standards, Washington, DC.
Probabilistic Description of Hurricane Wind Speeds.
Final rept.
Martin E. Batts. Jul 82, 7p
Pub. in American Society of Civil Engineering 108, nST7 p1643-1647 Jul 82.

This note presents information on the parameters of the best fitting Weibull Distributions estimated for hurricane windspeeds simulated as described in a previous paper, and shows the effect of the incorrect assumption that an Extreme Type I distribution rather than a Weibull distribution, is the appropriate description of the extreme windspeeds.

PB82-811456 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hail: Meteorology, Damage, Prevention, and Forecasting. 1976-September, 1982 (Citations from the NTIS Data Base).
Sep 82, 110p
Supersedes PB81-807554 and PB80-809692.

The research cited included information on hail storms, hail formation, hail damage, and warning systems. Atmospheric and cloud physics associated with hail, storm tracking, storm forecasts, and meteorological instruments are covered. Studies on meteorological fronts and storms which accompany hail, and methods to modify these systems, are also cited. (This updated bibliography contains 104 citations, 19 of which are new entries to the previous edition.)

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A118 457/1 PC **A04**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Biotechnology Research Requirements for Aeronautical Systems through the Year 2000. Volume I.
Final rept. 1 Apr 81-30 Jul 82,
H. Herbert Peel. 30 Jul 82, 60p SWRI-14-6522-VOL-1, AFOSR-TR-82-0642-VOL-1
Contract F49620-81-C-0059
See also Volume 2, AD-A118 458.

This report discusses the basic biotechnology research problems that require solution by the year 2000 to ensure optimum performance of manned Air Force aeronautical systems. The projected aeronautical systems for strategic, tactical and support systems are discussed, with emphasis placed on the roles of increased automation and information processing, as well as the increased physical stress of higher performance aircraft, extended mission durations and new weapon threats. Six generic areas of biotechnology are considered, along with the research needed to address the needs of the year 2000 aircrew. First discussed is the human-machine symbiosis needed in systems that will become extraordinarily complex. This is followed by the related needs in developing improved human-machine information interfaces that avoid overloading the human operator or pilot. Many missions of the future will be unforgiving and of high intensity. The problems and research needed to deal with the increased stress and to protect and enhance aircrews' performance during these missions are discussed in detail. The report discusses how simulators can be advanced to provide not only better training for aircrews, but also how they can be used in the development of new systems for optimizing the human-information-machine relationship.

AD-A118 458/9 PC **A10**/MF **A01**
Southwest Research Inst., San Antonio, TX.
Biotechnology Research Requirements for Aeronautical Systems through the Year 2000. Volume II. Proceedings of Biotechnology Research Requirements Study Session, 4-8 January 1982.
Final rept. 1 Apr 81-30 Jul 82,
H. Herbert Peel. 30 Jul 82, 204p SWRI-14-6522-VOL-2, AFOSR-TR-82-0643-VOL-2
Contract F49620-81-C-0059
See also Volume 1, AD-A118 457.

This report discusses the basic biotechnology research problems that require solution by the year 2000 to ensure optimum performance of manned Air Force aeronautical systems. The projected aeronautical systems for strategic, tactical and support systems are discussed, with emphasis placed on the roles of increased automation and information processing, as well as the increased physical stress of higher performance aircraft, extended mission durations and new weapon threats. Six generic areas of biotechnology are considered, along with the research needed to address the needs of the year 2000 aircrew. (Author)

AD-A118 546/1 PC **A24**/MF **A01**
Army Procurement Research Office, Fort Lee, VA.
1982 Federal Acquisition Research Symposium, Integrating Theory and Experience: The Acquisition Research Connection.
1982, 574p Rept no. APRO-81-50
Proceedings of Federal Acquisition Research Symposium held at the George Washington Univ., Washington, DC on 5-7 May 82.

Contents: Acquisition Risk and Uncertainty; Acquisition Information Management; Productivity; Effective Acquisition Strategies; New Procurement Techniques; and New Developments in OMB Circular A-76.

AD-A118 594/1 PC **A07**/MF **A01**
United States Metric Board, Arlington, VA.
Research Overview and Analysis.
Final rept.
Apr 82, 131p

The Research Overview and Analysis report by the USMB's Research Staff provides a comprehensive review and analysis of metric research. As part of this effort, the project reviewed all Board research studies, the General Accounting Office's study, the National Bureau of Standard's U.S. Metric Study, as well as other metric studies and surveys. (Author)

AD-A118 601/4 PC **A03**/MF **A01**
United States Metric Board, Arlington, VA.
Metric Usage Study: A Look at Six Case Histories.
Final rept.
1982, 32p

This study was prepared to describe the metric experiences, good as well as bad, of a number of firms representing a cross-section of American business and industry. Their experiences show that there are problems as wel as opportunities inherent in metric conversion. The six case histories presented in this publication reflect the trend, the drawbacks, and the merits of metric usage in the private sector. The United States Metric Board was created by Congress to plan and coordinate the increasing voluntary use of the metric system in the United States. This study has been developed as part of the Board's public awareness and education program. The six firms that were studied are Black and Webster, Samuel Cabot, Inc., Caterpillar Tractor, National Distillers Company, Levi Strauss & Co., and Inland Steel Company in the preparation of this publication. (Author)

AD-A118 649/3 PC **A06**/MF **A01**
International Resource Development, Inc., La Grange, IL.
Evaluating Quality Circles in U.S. Industry: A Feasibility Study.
Technical rept.,
H. Ned Seelye, Edward C. P. Stewart, and Joyce A. Sween. 30 Jun 82, 113p Rept no. RR-ONR-82-1
Contract N00014-82-C-0135

This study determined that it is feasible to conduct nationwide experimental research into the effectiveness of the most structured form of participative management--small, specially-trained work groups formed along the lines of Japanese quality control circles. The number of 'quality circles' in U.S. industry began to increase dramatically in 1980 and continues to gain wide popularity. Identification was made of over 1500 U.S. work sites with functioning quality circles. Of these, descriptive data were obtained on 713 sites, the vast majority of which were willing to participate in an evaluation of their circles effectiveness and which were past the initial 'pilot' stage of quality circles implementation--suggested criteria for inclusion in Phase II research. (A discriminant analysis determined that the characteristics of sites that were willing to participate in Phase II research did not differ substantially from those not willing to participate.) The range of sites identified is sufficiently broad to constitute a cross-section of U.S. organizations with functioning quality circles. From this pool a Phase II sample can be drawn.

AD-A118 808/5 PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Logistics Models: Evolution and Future Trends,
Stephen M. Drezner, and Richard J. Hillestad. Mar 82, 28p Rept no. RAND/P-6748

We have presented only a sample of the functional areas and logistics support models, but it should be clear that logistics has been and will continue to be rich territory for operations research models. Mathematical programming, stochastic analysis, simulation, and other approaches have certainly made important contributions to military logistics. The models are evolving toward the wartime support aspects of logistics and more relevant measures of military performance. Finally, as weapons systems and support requirements become more sophisticated and complex there are important issues requiring more integration of military modeling areas. Examples of the wider application of these newer models are for studying basic, general decision areas such as tradeoffs between short term and long term goals--i.e., between readiness and force modernization, or the allocation of relatively fixed dollars among competing but interrelated demands (people, test equipment, spares, transportation). (Author)

AD-A118 841/6 PC **A04**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
A Conceptual Decision Methodology for High Technology Transfer Assessment.
Study project,
Donald E Carr, William W. Cox, and Fred A. Sharp. May 82, 75p

Substantial controversy has occurred in nearly all United States policy decisions associated with high technology transfers to foreign countries. Some of the controversy occurs due to poor definition relevant to technology transfer concepts and terms. Still other controversy results from diffusion of the policy process among the many governmental agencies charged with review of high technology transfer decisions. The study hypothesizes that much of the controversy stems from lack of utilization of a common and consistent methodology for conceptualizing basic elements of decision processes associated with high technology transfer cases. A decision concept or methodology is developed from classical decision theory which may assist in the resolution of conflicts associated with high technology transfer decisions. Utilization of the decision framework is demonstrated and indicates how policymakers may better focus their attention consistently on the critical elements of decisions and policy formulations involving high technology transfer. (Author)

DE82008172 PC **A04**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
Site-Specific Legal and Institutional Analysis of the Barriers to Geothermal Hydrothermal Commercialization Present at Target Prospects in the Five Pacific Rim States.
20 Oct 79, 52p DOE/ET/27241-T9
Contract AC03-79ET27241

The specifics of the permitting process, land access, power plant siting, water law, and other legal or institutional barriers or conflicts are presented for each of the most highly regarded target electric prospects in the

five Pacific Rim states: California, Hawaii, Alaska, Oregon, and Wasington. (ERA citation 07:046464)

DE82008499 PC **A03**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
Analysis of the Obstacles to Financing Geothermal Hydrothermal Commercialization Projects and the Government Programs Designed to Remove Them.
20 Mar 81, 27p DOE/ET/27241-T2
Contract AC03-79ET27241

The risks associated with geothermal hydrothermal commercialization are broken down into five categories: resource risk; technological risk; regulatory risk; investment parity risks; and institutional risk aversion. The impact of each risk upon geothermal financing is assessed. The federal government's programs to provide financial incentives for geothermal development are presented as follows: tax incentives; indirect financial incentives programs; direct grant/cost-sharing programs; and attempts at reducing regulatory risk through the enactment of legal and institutional reforms. (ERA citation 07:046458)

DE82008500 MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
Current California Legislative and Regulatory Activity Impacting Geothermal Hydrothermal Commercialization: A Monitoring Report. Report No. 1017.
20 Jan 80, 41p DOE/ET/27241-T3
Contract AC03-79ET27241
Portions of document are illegible.
Available in microfiche only.

Four key geothermal-impacting bills presently before the California legislature are described. Two deal with state financial backing for geothermal projects. The third relates to the use of the state's share of the BLM geothermal revenues and the fourth to the protection of sensitive hot springs. The current regulatory activities of the California Energy Commission, the California Division of Oil and Gas, and the counties are discussed. (ERA citation 07:046459)

DE82008501 PC **A04**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
State Water Rights Law and Geothermal Hydrothermal Commercialization in Five Pacific Rim States.
20 Mar 80, 53p DOE/ET/27241-T6
Contract AC03-79ET27241

The water rights of the five Pacific states - California, Oregon, Washington, Alaska, and Hawaii - and their possible impacts on geothermal development are discussed. (ERA citation 07:046462)

DE82012774 MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Accelerating the Buildings Sector's Sluggish Response to Rising Energy Prices by Federal R and D, Information, and Analysis Programs.
A. H. Rosenfeld, and M. D. Levine. Apr 81, 33p LBL-12739, EEB-81-2
Contract AC03-76SF00098
Portions of document are illegible.
Available in microfiche only.

Ways of speeding the market's response to higher energy costs for the buildings sector are discussed with special reference to the role of the federal government. Federal support is indicated in two main areas: (1) programs to alleviate possible public health and welfare effects, (2) programs to speed the day when the market's performance is closer to optimal. The first area includes research programs such as indoor air quality. Reducing the leakage of heated or cooled air from buildings can save half a million barrels a day of oil equivalent (approximately one quad per year), but may have undesired health effects. Indeed, research has shown that for certain indoor air pollutants, health effects may already be occurring in today's poorly sealed buildings. Research on this topic can help ensure that leak plugging in homes and commercial buildings will not affect public health, but it is precisely this type of R and D that is least likely to be supported by private industry. The second area calling for government involvement to reduce market lag industry includes testing and labelling homes for their energy consumption; development of essential diagnostic equipment that would be difficult to patent (such as the Princeton/LBL blower door); and short-term technology development in areas where there is currently no US manufacturer (such as the air-to-air heat exchanger) or where inertia needs a small push to get it moving (such as electronic fluorescent ballasts). Details of all these examples are given, with costs and expected savings. It is concluded that there is a potential to save $50 billion anually by improved energy efficiency in buildings, and that federal programs costing a few million dollars each year could advance the date of these savings by several years.

HRP-0904323/3 PC **A03**/MF **A01**
Institute for Health Planning, Inc., Madison, WI.
Estimating Hospital Capital Requirements from Capital Expenditure Plans,
Andrew J. Hogan. Jul 82, 32p IHP-8229
Contract PHS-HRA-232-79-0036

In this document, one of the principal approaches to estimating hospital capital requirements--the capital expenditure plan method--is discussed. The experience with this method at the state level is reviewed and some of the critical issues in using this approach effectively are analyzed. The focus is on the formulation and collection of capital expenditures plans, on the improvement of the quality of existing planning practices, and on the reduction of bias when making plans public. With this background, the current difficulties in using capital expenditure plans for establishing capital needs is examined. Strategies for improving capital expenditure plans then are analyzed.

HRP-0904328/2 PC **A03**/MF **A01**
Institute for Health Planning, Inc., Madison, WI.
Improving Operations Management: Lessons from Multihospital Systems,
Andrew J. Hogan. Jul 82, 50p IHP-G8218
Contract PHS-HRA-232-79-0036

This document surveys the recent experience of multihospital systems with advanced management techniques and reviews promising applications for the not-for-profit and public autonomous hospital. The analysis begins with an overview of hospital production. A simple schematic model is used to explain some key issues in hospital operations management and to tie together the discussion of a variety of advanced management techniques. Areas for improvement in hospital operations management have been selected because they offer promise in responding to several key managerial issues. These key issues include the tight money market with resulting high interest rates, the difficulty in recruiting and retaining nursing personnel, the increased competition for hospital patients on the basis of price, and proposed changes in public reimbursement policies. Six areas for improvement in hospital operations management were identified: purchasing, patient census management, marketing, inventory, cash management, and shared services. For each area, a discussion of some of the elements of efficient management is presented. A brief review of the recent literature on the response of multihospital systems is made, and some comments on the feasibility and costs of implementation are offered. An annotated bibliography is included.

PB82-166067 MF **E18**
National Science Foundation, Washington, DC.
Summaries of NSF Projects, Fiscal Year 1981 (Form 98-A - Abstracts).
1982, 14428p NSF/GPP-82001
See also PB82-164617.
Microfiche copies only.

Projects performed under National Science Foundation grants completed in 1981 are summarized. Awards consist of grants for research, symposia, workshops, and conferences. The volume is organized into the following broad disciplinary areas of research: (1) Astronomical, Atmospheric, Earth, and Ocean Sciences, including polar research; (2) Biological, Behavioral, and Social Sciences, including anthropology, cognitive science, neurosciences, environmental biology, information science and technology (S&T), physiology, cellular and molecular biology, economics, and political science; (3) Engineering, including chemical, process, civil, environmental, electrical, computer, systems, and mechanical engineering, and applied mechanics; (4) Mathematical and Physical Sciences, including chemistry, materials research, mathematical and computer sciences, and physics; (5) Science and Engineering Education, including science education development and research, resources improvement, and scientific personnel improvement; and (6) Scientific, Technological, and International Affairs, including industrial science and technological innovation, intergovernmental and public service S&T programs, international programs, policy research and analysis, and science resource studies. Titles of reports, authors, award numbers and time periods, and performing organizations are provided.

PB82-252131 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.
The Treasury Department and Its Bureaus Can Better Plan for and Control Computer Resources.
Report to the Congress.
22 Feb 82, 81p GGD-82-9

The use of computer resources throughout Treasury could be improved with more effective guidance and better overall management. Computer resources in many Treasury bureaus either exceed or fall short of program requirements they are intended to support. The results are unnecessary costs and unmet user needs. The Paperwork Reduction Act of 1980 offers a significant opportunity for Treasury - as well as other Federal agencies - to improve planning, coordination, and accountability over computer resources. This report discusses the potential of the act for improvements at the Department and bureau level and contains recommendations for implementing certain of the act's provisions. GAO also develops a framework of well recognized planning and control procedures that can substantially increase the active involvement and direct participation of top officials and users in the management of computer resources.

PB82-252149 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Legislative and Administrative Changes to Improve Verification of Welfare Recipients' Income and Assets Could Save Hundreds of Millions.
Report to the Congress.
14 Jan 82, 77p HRD-82-9

This report discusses legislative and administrative changes needed to improve agencies' ability to verify income and asset information reported by applicants and recipients of welfare programs. Specifically, this report discusses the differences in verification requirements among programs, the inadequacies of current verification processes, and Federal laws and regulations which restrict the use of information that could significantly improve the verification process.

PB82-253394 PC **A12**/MF **A01**
Pennsylvania State Univ., University Park.
The Role of University Organized Research Units in Academic Science,
Robert S. Friedman, Renee C. Friedman, Kenneth P. Mortimer, Stephen M. Bragg, and Frank L. Sherman.
Jun 82, 270p NSF/PRM-82004
Grant NSF-PRM79-00665

Research was undertaken to determine the role played by organized research units (ORUs) at the leading research universities and their medical schools in the United States. ORUs may be funded by endowments, line-item appropriations, retention of overhead, institutional support, and multiyear and short-term grants and contracts. Public universities are more prone to formalize the procedures for the establishment of ORUs than are private universities. The status of the professional staff within ORUs remains unresolved. Salary and fringe benefits tend to be similar for faculty and professional staff with equivalent experience; but, in addition to being denied tenure and sabbatical leave, professional staff members are not allowed to participate in decision-making bodies. Successful ORUs require initial and continuing support from sponsors, university administration, and interested faculty. It is recommended that no ORU be created unless its mission and modus operandi complement the strength and fundamental values of the institution; that policy makers within the university develop a system for governing, evaluating, and dismantling ORUs; and that universities create a more orderly and predictable career ladder for their professional staff.

PB82-257346 PC **A04**/MF **A01**
National Science Foundation, Washington, DC.
Research and Developmemt in Industry, 1979. Funds, 1979: Scientists and Engineers, January 1980.
Final rept.,

Dec 81, 75p NSF-82-304

Industrial R&D expenditures for 1979 totaled $38 billion, a 14% gain over the preceding year and a 5% increase after adjustment for inflation. Between 1975 and 1979, total real outlays by industry climbed steadily at an average annual rate of 4.9% per year. Rapidly advancing technology, escalating demand for new products and services, and fierce domestic and foreign competition trigggered this increased flow of resources into research and development during the late seventies. Increases in both company financing and Federal support of industrial R&D projects contributed to the real growth in R&D expenditures. Company-financed R&D activities, however, grew 6% per year between 1975 and 1979, a significantly faster pace than that of federally sponsored industrial research and development. Between 1975 and 1979, outlays for all three types of industrial R&D activity--basic research, applied research, and development--rose at an average annual rate of about 5% (in real dollars). Outlays for energy-related R&D projects totaled $3.7 billion or 21% higher than during 1978. Firms employed a record number--452,000--of R&D scientists and engineers in January 1980, representing a gain of 7% over the previous January.

PB82-257403 PC **A05**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
National Patterns of Science and Technology Resources, 1981.
Science and technology statistics, 1953-81.
Apr 81, 90p NSF-81-311
See also PB81-231169.

This report presents data on the dollar volume of research and development performed within each sector of the economy, sources of financing, numbers of scientists and engineers, international comparisons, and other economic characteristics of the Nation's science and technology effort.

PB82-258435 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Solving Social Security's Computer Problems: Comprehensive Corrective Action Plan and Better Management Needed.
10 Dec 82, 68p HRD-82-19

Social Security's daily operations and service to the public are being threatened by serious problems in its computer operations. The agency itself says it is facing a crisis in managing its computer systems. Social Security is developing a comprehensive plan to resolve its computer problems. This report summarizes prior GAO findings and presents recommendations to the Secretary of Health and Human Services to help the agency develop an effective plan and implement it successfully.

PB82-259508 PC **A08**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Peasants, Officials and Participation in Rural Tanzania: Experience With Villagization and Decentralization,
Louis Fortmann. 1980, 165p RLO-1, AID-PN-AAJ-632
Contract AID/ta-BMA-8

Tanzania has failed to realize its goals of participatory socialism and collective agricultural production. The fault lies with the definition and implementation of these policies by a central government bureaucracy structurally and attitudinally similar to its colonial antecedents. This report examines Tanzania's colonial and post-independence bureaucracies in relation to the two conflicting driving forces of rural development: the need for genuine local decisionmaking to ensure a commitment to development programs and the need for central control to allocate scarce resources in a coherent nation-building strategy.

PB82-259706 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Accounting and Financial Management Div.
The Federal Audit Function in the Territories Should Be Strengthened.
25 Mar 82, 94p AFMD-82-23

The audit function presently performed by the U.S. Government Comptrollers in American Samoa, Guam, the Northern Mariana Islands, the Virgin Islands, and Trust Territory of the Pacific Islands needs to be independent and more effective. But a strengthened Federal audit function alone is not enough. More Federal technical assistance, coupled with the assumption of greater responsibility by the territories for financial management, is needed to improve audit effectiveness. GAO is recommending, among other things, that the Congress transfer the audit authority and staff of the U.S. Government Comptrollers to the Office of the Inspector General, Department of the Interior.

PB82-259722 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
More Effective Leasing Procedures and Practices Could Help GSA Reduce Delays in Meeting Federal Space Needs.
Report to the Congress.
10 May 82, 90p PLRD-82-46

This report discusses the reasons why it takes the General Services Administration longer than its stated goal of 6 months to complete about half of Federal agencies' requests for space, the adverse impact of delays on agency operations, and the changes needed to improve performance.

PB82-260258 PC **A04**/MF **A01**
Development Alternatives, Inc., Washington, DC.
Integrated Rural Development: Making It Work. Executive Summary,
George Honadle, Elliott R. Morss, Jerry VanSant, and David D. Gow. Jul 80, 55p AID-PN-AAJ-468
Contract AID-DSAN-C-0065

As part of an A.I.D. project to assist managers of integrated rural development (IRD) projects, in which success depends as much on effectively mobilizing complex resources as on technical expertise, this report, based on a 2-year experience in 10 developing countries, presents the state-of-the-art in IRD project management. Around the two key factors of organizational design and managerial tactics, the report details a wide range of perennial problems and choices faced by IRD project managers in delivering goods and services, eliciting local response, and effecting self-sustaining improvements.

PB82-261025 PC **A03**/MF **A01**
Vrije Univ., Amsterdam (Netherlands).
Models of Know-How and Technics Transfers in the International Order,
F. H. Brookman. 1982, 48p 1982:1

The report explains and evaluates the methods of technology transfer, particularly those methods used to transfer technology to less developed countries.

PB82-262494 PC **A03**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Problems of Small, High-Technology Firms.
Special rept.,
William L. Stewart, and Norman W. Friedman. Dec 81, 43p NSF-81-305
See also PB-263 779.

The report summarizes the findings of a 1977 National Science Foundation mail survey of small, high-technology companies active in research and development and of a series of in-depth interviews held in 1979. Firms were questioned about eleven problem areas dealing with finance, personnel, government regulations and other concerns such as high-risk research and development and transition from research and development to marketing.

PB82-262627 PC **A04**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
The Management Capacities of Rural and Small Cities: An Exploratory Overview.
Staff rept.,
Beth Walter Honadle. Jul 82, 75p AGES-820721

Smaller, nonmetropolitan cities have different needs and management practices from their larger, urban counterparts. For instance, the smaller nonmetro cities are more likely to use line-item budgets. They are less likely to engage in cooperative purchasing agreements, to have budget manuals, or to use centralized purchasing. They are also less likely to offer employee incentives. Among the highest priority planning and management needs of nonmetropolitan cities are (1) community relations skills, (2) upgrading personnel, (3) information gathering and analysis capabilities, (4) forecasting, (5) land use plans, and (6) data processing.

PB82-263104 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.
Early Observations on Block Grant Implementation.
Report to the Congress.
24 Aug 82, 69p GAO/GGD-82-79, B-206864

This report discusses 13 States' early experiences in making the transition tO the block grants authorized by the Omnibus Budget Reconciliation Act of 1981. GAO performed this review to provide the Congress, Federal executive agencies, and others information on what States are doing to accommodate their new responsibilities. The report should be useful in deliberations on future block grant proposals.

PB82-263286 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Health Resources Div.
Impact of Congressional Review on Federal Trade Commission Decisionmaking and Rulemaking Processes.
Report to the Congress.
17 Aug 82, 19p GAO/HRD-82-89, B-201197

This report points out that only two final rules have been submitted for congressional review as required by section 21 of the Federal Trade Commission Improvements Act of 1980. Congressional review delayed the effective date of one rule and prevented the other rule from becoming effective. However, GAO's review of seven rulemaking proceedings showed that congressional review has had only a limited impact on the Commission's decisionmaking and rulemaking processes.

PB82-263575 PC **A09**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Federal Funds for Research and Development: Fiscal Years 1980, 1981, and 1982. Volume XXX.
Detailed statistical tables.
Jul 81, 184p NSF-81-325
See also Volume 29, PB82-118902.

These 121 detailed tables present data on R&D activities of Federal agencies for the 1980-82 period by a number of breaks. They cover research and development by agency, character of work (basic research, applied research, and development) and performer, research by agency, performer and field of science; basic research, applied research, and development by agency and performer; total research, basic research and applied research performed at universities and colleges by agency and field of science. They also provide data on R&D plant obligations by agency. In addition, data are provided on foreign performers and the distribution of R&D obligations by State. Historical series for major categories for the 1980-82 period are also given.

PB82-263674 PC **A05**/MF **A01**
National Research Council, Washington, DC. Committee on NASA Scientific and Technological Program Reviews.
Aeronautics Research and Technology: a Review of Proposed Reductions in the FY 1983 NASA Program.
Final rept.,
Jul 82, 81p
Contract NASW-3511

The FY 1983 budget for NASA's Aeronautics R&T Program was substantially lower than its level of prior years with curtailment of 19 programs proposed. Only basic research and systems technology programs judged to support military needs were retained. The Congressional Committees on Appropriations requested that the National Research Council Committee on NASA Program Reviews examine the potential impact of these proposed changes identifying the national criticality of key programs, the risk associated with satisfactory completion of each program, and the degree to which these programs might be assumed by the private sector. A panel chaired by Dr. Alexander Flax held three two-day meetings and prepared the assessments. Nine programs proposed for curtailment were found to be of high priority, while some level of support

within the R&T Base was considered appropriate for six other programs. The highest priority items were three programs in composite materials and structures; completion of the Energy Efficient Engine Program; the Advanced Turboprop Program and ATP, Phase III; completion of the Energy Efficient Transport Program, High Performance Military R&T, and Facility Productivity Improvement. The study included consideration of government's role in bridging the gap between basic research and early application of technology in aeronautics.

PB82-263724 PC **A06**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Academic Science: R and D Funds, Fiscal Year 1980 (Detailed Statistical Tables).
Surveys of science resources series (Annual).
Apr 82, 124p NSF-82-300
See also PB81-188047.

The publication contains tabular data on 563 institutions of higher education regarding scientific and engineering (S/E) R&D expenditures that are separately budgeted (current-fund expenditures budgeted and restricted specifically to R&D activities during the subject fiscal year). Data are the product of the National Science Foundation's annual Survey of Scientific and Engineering Expenditures at Universities and Colleges, FY 1980. The survey is confined to institutions offering doctoral or master's degrees in academic S/E programs having $50,000 or more in separately budgeted R&D expenditures. The 19 federally financed research and development centers also are included. Data are tabulated by: (1) Source of funds; (2) by S/E discipline; (3) character of work; (4) control of institution (public/private); (5) highest degree offered; and, (6) largest performers' ranking. Trend tables are included for most elements. The methodology and response rate are described and a reproduction of the survey instrument is included.

PB82-263922 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Procurement, Logistics, and Readiness Div.
VA Should Use Economic Order Quantity Principles in the Wholesale Supply System.
18 Aug 82, 30p GAO/PLRD-82-108, B-208494

Changes in wholesale supply operations at the Veterans Administration could reduce net ordering and carrying costs, inventory investment, and warehouse space. The primary vehicle for achieving these reductions is the economic order quantity principle--a mathematical method for determining the purchase quantity that will result in the lowest total cost to order and carry inventory. Additional reductions are possible by basing safety stock requirements on variations in customer demands and procurement leadtime requirements on actual experience.

PB82-265026 PC **A04**/MF **A01**
Federal Trade Commission, Washington, DC. Bureau of Consumer Protection.
Civil Penalties: Policy Review Sessions.
6 Jul 82, 59p FTC/BCP-82-01

This briefing book was prepared by FTC staff for the Commission's Policy Review Session on civil penalties, which was held on July 6, 1982. Its purpose was to structure Commission discussion and review of civil penalties' role in FTC's consumer protection mission. The Commission has used the threat of civil penalties as an important tool to enforce its regulations and orders. Due to variation of the goals served by civil penalties and the seriousness of the violations involved, assessed penalties have ranged from a few hundred dollars to over a million dollars. Such significant variations in the size of these assessments strongly suggest a need for a general theory of determining the amount of civil penalties, in order to provide guidance to both staff and industry. The publication presents several options. Previously, FTC could seek in federal court civil penalties from firms that violated its trade regulation rules or final orders. However, in 1975, Section 205 of the Magnuson-Moss Warranty-FTC Improvements Act empowered FTC to seek civil penalties for a firm's first violation of FTC law, if it could show that defendant had actual knowledge of the unlawfulness of its acts or practices. The briefing book discusses the strategic uses of Section 205 civil penalties and poses several relevant legal and policy issues. Included in the book is an appendix presenting an approach to assessing civil penalties using the deterence model, together with an economic overview discussing efficient FTC law enforcement.

PB82-811589 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Urban Financing and Taxation. 1978-May, 1981 (Citations from the NTIS Data Base).
Sep 82, 238p
Supersedes PB80-807639 and NTIS/PS-79/0225.

Methods of financing and taxation for urban areas are discussed. The studies cover the planning, implementation, amount of revenues raised, and the effects of financing and taxation. A relatively large number of reports on property taxes are included. Financing for transportation and pollution control is excluded. (This updated bibliography contains 231 citations, none of which are new entries to the previous edition.)

PB82-811597 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Urban Financing and Taxation. June 1981-July 1982 (Citations from the NTIS Data Base).
Sep 82, 104p
Supersedes PB81-806952 and PB80-807639.

Methods of financing and taxation for urban areas are discussed. The studies cover the planning, implementation, amount of revenues raised, and the effects of financing and taxation. A relatively large number of reports on property taxes are included. Financing for transportation and pollution control is excluded. (This updated bibliography contains 97 citations, all of which are new entries to the previous edition.)

PB82-875485 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Organization Planning and Design. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 290p
Supersedes PB81-850299.

This bibliography contains citations concerning organization design, planning service organizations, effective job organization, organization and administration of programs, planning and resources of community organization, administrative experiments in organization design, and guidelines for standards in the planning and organization of special services. (This updated bibliography contains 227 citations, 55 of which are new entries to the previous edition.)

PB82-875568 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Operations Research Applied to Maintenance and Repair. June, 1974-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 74-Sep 82.
Sep 82, 72p
Supersedes PB81-855645.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning systems analysis and operations research as applied to maintenance and replacement. Citations consider the development of maintenance techniques for predicting which performance requirements in a system may be affected by a proposed modification; and areas of systems operation, such as criticality of subsystems, unit availability, cost advantages, lost production costs, and capital versus maintenance cost trade-offs. (This updated bibliography contains 69 citations, 14 of which are new entries to the previous edition.)

PB82-875576 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Operations Research Applied to Maintenance and Repair. June, 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 345p
Supersedes PB81-855660.

This bibliography contains citations concerning systems analysis and operations research as applied to maintenance and replacement. Citations consider the development of maintenance techniques for predicting which performance requirements in a system may be affected by a proposed modification; and areas of systems operation, such as criticality of subsystems, unit availability, cost advantages, lost production costs, and capital versus maintenance cost trade-offs. (This updated bibliography contains 278 citations, 87 of which are new entries to the previous edition.)

PB82-875584 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Operations Research Applied to Maintenance and Repair. June, 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for Jun 76-Sep 82.
Sep 82, 106p
Supersedes PB81-855637.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning systems analysis and operations research as applied to maintenance and replacement. Citations consider the development of maintenance techniques for predicting which performance requirements in a system may be affected by a proposed modification; and areas of systems operation, such as criticality of subsystems, unit availability, cost advantages, lost production costs, and capital versus maintenance cost trade-offs. (This updated bibliography contains 87 citations, 27 of which are new entries to the previous edition.)

PB82-875907 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computerized Inventory Control. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 240p
Supersedes PB82-855560.

This bibliography contains citations concerning data processing concepts, techniques, equipment, systems, and operations for the control of stock procurement, inventory, and dissemination or distribution. A wide variety of civilian and military stocks and materials are considered. Coverage is worldwide. (This updated bibliography contains 276 citations, 103 of which are new entries to the previous edition.)

PB82-876269 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Incentive Plans. June, 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 303p
Supersedes PB80-853591.

This bibliography contains citations concerning research studies relative to the theory, design and applications of employee incentive programs. Benefits of such incentive plans for cost containment, improvement of the quality of work life and the improvement of production are discussed. (This updated bibliography contains 247 citations, 83 of which are new entries to the previous edition.)

5B. Documentation and Information Technology

AD-B058 875/6 PC **A03**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
Swedish Defence Research Abstracts 80/81-1 (Froe Foersvars Forsknings Referat 80/81-1).
Mar 81, 27p RAE-LIBRARY TRANS-2068, DRIC-BR-79192
Distribution limitation now removed.

No abstract available.

DE82008869 MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Interactive Indexing-Editing System for DOE Technical Information Center.
B. A. Cerny, and J. D. Lawrence. Feb 82, 13p LBL-14049, CONF-820624-1

Contract W-7405-ENG-48
American Society for Information Science mid-year meeting, Knoxville, TN, USA, 13 Jun 1982, Portions of document are illegible.
Available in microfiche only.

A system to provide computer assisted aids to document indexing for the Department of Energy Technical Information Center Energy Information Data Base is being developed. The goal is to allow more efficient processing of documents and document surrogates by using interactive computer techniques rather than the current combination of manual indexing and batch computer processing. It draws on automatic indexing techniques, but includes the indexer as an integral element of the system; he is the decision-maker while the computer provides clerical support. This approach is transferable to other large production systems.

DE82013986 MF **A01**
TRW, Inc., McLean, VA. Energy Systems Planning Div.
Business Management Information System (BMIS): Procedures Manual.
Sep 78, 29p DOE/ET/20154-T2
Contract AC05-78ET20154
Available in microfiche only.

Interim Energy Technology policy guidelines for implementation, management, and operation of the ET Business Management Information System (ET-BMIS) are established. The objective of the ET-BMIS, the ET financial management information system for addressng the functions of budget formulation, budget execution, and procurement planning and tracking, is to satisfy line managers' needs for program information. The system capability, i.e., what information is to be provided to support line managers' needs, is described. How the system is to accomplish this is addressed. The participants and their roles are identified. Attachments include: (1) a chart illustrating the flow of ET-BMIS activities and information, from budget formulation through project completion; (2) a tabulation of current system data elements and recommended sources; and (3) a chart of potential output-reporting capabilities.

DE82903319 MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
List of JAERI Reports for 1979.
Sep 80, 27p NP-2903319
In Japanese and English.
U.S. Sales Only. Available in microfiche only.

No abstract available.

DE82904528 PC **A03**/MF **A01**
Nuclear Energy Agency, Paris (France). Nuclear Data Committee.
Summary Record of the Twenty-Second Meeting (Technical Sessions) Aix-en-Provence (France) 5-10 April 1981.
S. Qaim. 1981, 33p NEANDC-145-U
U.S. Sales Only.

Advances in nuclear data measurements; newer facilities, instrumentation, and separated isotopes; advances in nuclear data centers; and activities of nuclear data centers are summarized. Subcommittee reports on meetings and activities are included. (ERA citation 07:047076)

ED-200 239 Not available NTIS
Planning and Development of a Conservation Facility,
Betty A. Coley. 10 Dec 80, 31p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper reviews the current literature on the preservation of library materials and develops an overview of the state-of-the-art for conservation programs. The 13 references provided are concerned with the preservation of book materials, the design of processes and facilities to prevent or retard deterioration, development of disaster planning, salvaging of damaged materials, and preparation of conservation policy statements. A pamphlet and two leaflets from the Library of Congress are attached.

ED-200 240 Not available NTIS
The Ohio School Library/Media Test and Manual,
Anne M. Hyland. 1978, 25p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210. Also available from Dr. Anne M. Hyland, 236 E. Clearview, Worthington, OH 43065 ($3.00 per copy; 30 test booklets for $25.00).

An instrument which can be used to measure the school library/media ability of students in grades 4-12 was developed in Ohio, using 2,670 students from rural, suburban, and urban settings. The test covers five broad areas: (1) how things are organized, (2) the skills needed to select appropriate resources, (3) the skills needed to use each resource, (4) the skills needed to comprehend the information given, and (5) the skills needed to present the information in a meaningful way to others. The test can be used for diagnosing areas where students need library instruction, as a pre-post test to determine effectiveness of library instruction, and to correlate studies between library/media skills and academic achievement.

ED-200 241 Not available NTIS
Mississippi Bend Area Educational Agency, Davenport, IA.
Media Ideas Handbook,
John T. Haack. Jan 81, 91p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Library and media personnel from the Mississippi Bend Area Education Agency contributed to this handbook, which provides teaching, administrative, organizational, and management materials applicable to a K-12 school environment. These materials are divided into such categories as literature, storytime, promotions, equipment operation and usage, reference, Dewey Decimal and card catalog, potpourri of activities, potpourri of procedures, and general bibliography.

ED-200 242 Not available NTIS
Auburn Univ., AL. School of Education.
Materials Processing: Centralized Versus the Individual School, A Continuing Controversy,
1979, 19p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

A two part survey was conducted in a large school district to determine the kind and extent of centralized versus individual school materials processing. Processing included both the cataloging and the physical preparation of materials, which would be done either at the centralized school district facility or by the staff in the individual secondary school library. Issues to be investigated centered on short-range and long-range implications. Short-range implications focused on: (1) processing costs, (2) catalog card soruces, (3) administrative personnel attitudes, (4) time lapse in receiving materials in the schools, and (5) the effects of centralized processing for the school librarians. Long-range implications looked at the cost effectiveness of central processing, the acceptability of a general classification scheme to individual libraries, and the effects of centralized processing on library service efficiency. A questionnaire based on these implications was developed and sent to 17 secondary school librarians, and an interview was conducted with the School Library Department Consultant. Results indicated that processing costs for individual schools in terms of professional/clerical time was much greater than for centralized processing, and that there was little or no delay in getting materials shelf-ready from the district service center. References are included.

ED-200 246 Not available NTIS
South Carolina State Dept. of Education, Columbia.
Annotated Listing of South Carolina Department of Education Publications.
1980, 180p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Developed to provide a cataloging system for department publications and to improve their accessibility for educators, this annotated bibliography includes a listing of availability sources for the major publications issued by the department. Updated annually, the list is grouped into sections by appropriate descriptor terms which appear in the table of contents, and includes subject and institution indexes. The major descriptors used are abilities, administration, arts, attitudes, audiovisual materials and methods, counseling, demography, environment, facilities, finance, government, handicapped, health and safety, instruction, library science, personnel and groups, physical education and recration, programs, reading, research, social sciences, and tests.

ED-200 248 Not available NTIS
California State Univ. and Colleges, Los Angeles.
CSUC Standard for the CLSI Expanded Title Record,
Barbara Case. 19 Feb 81, 14p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The system specifications described have been adopted by the 19 California State University and Colleges Libraries for use with the CL Systems Expanded Title Record format. It is anticipated that these specifications will be tested at California State University, Chico, beginning midyear 1981. Should this pilot demonstration prove successful, it is further expected that implementation of the CLSI public access system at all 19 CSUC campus libraries will follow. The specifications, which assume machine-readable bibliographic input through OCLC archival tapes and/or any other machine-readable bibliographic data captured in OCLC or LC-MARC compatible format are designed to accept and process all OCLC formats and their revisions, including those necessary for compatibility with the second edition of the Anglo-American Cataloging Rules.

ED-200 250 Not available NTIS
New York State Library, Albany.
Dictionary Catalog of Official Publications of the State of New York. Monographs Cataloged by the New York State Library, 1980, No. 2, January 1, 1980 to July 11, 1980.
1980, 165p
For related document, see ED 195 237.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

The first in a series of annual cumulations, this 1980 dictionary catalog provides a single alphabetical listing of monographs published by New York State and cataloged by the state library during the year. Produced from OCLC machine readable records, the catalog lists citations in traditional dictionary catalog order: i.e., authors, titles, series, subject, and secondary entries interfiled in one alphabet. Full bibliographic information appears only under the main entry, which also includes OCLC numbers and NYSL call numbers, time accession numbers, and copy location.

ED-200 251 Not available NTIS
The Government and Information: Costs, Choices and Challenges,
Laura E. Challman. Jun 80, 21p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This paper examines the involvement of the federal government in information activities and services, and raises questions about the legitimacy and consistency of this involvement. Three major areas of government policy in the information sector are discussed: research and development, the National Technical Information Service (NTIS), and public libraries. State and local policies in these areas are also described. It is argued that the research and development subsidy is consistent with the government's mission to support the public good, but that government support for the NTIS and public libraries is inappropriate because those services do not qualify as public goods. Twenty-two references are listed.

ED-200 252 Not available NTIS
California State Library, Sacramento.

Public Library Trustees and Commissioners Tool Kit: Orientation Guidelines,
Alice Dalbey. 1981, 55p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210. Also California State Library, P.O. Box 2037, Sacramento, CA 95809 (free, while supply lasts).

Compiled for newly installed library trustees and commissioners in the state of California, this publication provides guidelines designed to assist new board members in learning their jobs. Chapters discuss the nature of public library boards in California, board duties and responsibilities, board operations, special challenges for board members, and library contexts outside of the individual public library.

ED-200 253 Not available NTIS
Cincinnati Univ., OH. Univ. Libraries.
University of Cincinnati, Central Library, Computerized Bibliographic Retrieval Services: Evaluative Report, July 1979-August 1980,
Randall L. Roberts. 18 Dec 80, 28p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This 2-part report describes the present scope of the University of Cincinnati Central Library bibliographic database retrieval service. The first section discusses searcher training, records maintenance, search aids, expansion of database service, searcher time, user satisfaction, and promotion. The second presents statistical data related to database use, vendors, users, searcher experience, and cost recovery. Appendices contain sample search records and a list of databases arranged alphabetically by acronym.

ED-200 254 Not available NTIS
San Mateo County Peninsula Library System, Redwood City, CA.
Report on a Study of the Feasibility of Automated Circulation Systemwide for Peninsula Library System San Mateo County, California,
Idelle Port, and Joseph Matthews. Nov 80, 162p
Prepared in cooperation with Government Research Council for Congress of Elected Officials, Redwood City, CA.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This examination of the feasibility of implementing an automated circulation system within San Mateo County's Peninsula Library System (PLS) was undertaken to determine if the system should automate material circulation systemwide in order to reduce operating costs while improving circulation procedures and increasing patron access to system collections. The report describes PLS cooperative programs, current PLS circulation operations, PLS problems and objectives, circulation control alternatives, and a PLS action plan. Appendices and exhibits illustrate cost data, system configurations, budgetary information, and other considerations.

ED-200 255 Not available NTIS
Colorado Library Association, Denver.
Public Library Trustees of Colorado: Responsibilities and Opportunities. A Manual for the Trustees of Colorado Public Libraries.
Aug 80, 53p
Prepared in cooperation with Colorado State Library, Denver.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This basic reference on the responsibilities and opportunities of library trustees provides information on the public libraries of Colorado and how they are established, operated, and funded, as well as clues to needed information--i.e., some philosophy, many facts, opinions, recommended practices, and suggestions. Chapters focus on the types of libraries, the Colorado State Library, the legal base and governance of public libraries in the state, cooperation and networking, roles and responsibilities of trustees, policies and policy manuals, affirmative action, intellectual freedom, Friends of the Library, and volunteers. Appendices include sample bylaws for both public and combined school/public libraries and statements of policy on personnel, finances, and intellectual freedom. A glossary and an index are provided.

ED-200 257 Not available NTIS
Manitoba Dept. of Education, Winnipeg.
Subject Headings Guide: Adapted from Sears List of Subject Headings and the Canadian Companion to Sears. School Library Guide. SL-37-80.
1980, 35p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Compiled by the Manitoba Department of Education, this subject heading guide provides a listing of approximately 2,000 useful terms for cataloging and indexing in Canadian school libraries. Some scope notes, see, and see also references are provided, as well as indications of subdivisions for some categories.

ED-201 296 Not available NTIS
Washington State Library, Olympia.
A Network Managment Tool: Computer Simulation of Interlibrary Lending. I: The Report. II: A User's Manual for Models,
Hugh T. Vrooman, and Mary Jane Pobst Reed. Mar 79, 122p
GRANT OEG-007702313
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This report summarizes the findings and describes the products of a 2-part research project that examined the parameters of Washington's interlibrary loan cooperation statewide, and developed a set of computer models to be used in simulation studies of associated activities and policies. It contains a statement of the problem; an historical review; a description of methodology; a review of the findings of a statistical analysis conducted on interlibrary loan data; a discussion of the roles of an institution as a library and as a switching mechanism; explications and descriptions of the computer models and simulations; copies of the programs and portions of the printed output; and a bibliography listing 87 sources. It also provides a users' manual for the application of the models to simulate an institution's borrowing and lending activities for service planning and policy modification.

ED-201 297 Not available NTIS
King Research, Inc., Rockville, MD.
The Newton Free Library: An Analysis and Recommendations,
Nancy V. DeWath. Aug 80, 121p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This analysis of an affluent, well educated, family community and its library by a professional consulting organization used statistical and budget data, public meetings, and surveys of citizens, library users, and staff to determine the library needs of the community and to develop a plan for improved library services. Questionnaires were developed and administered (1) by telephone to more than 400 citizens using trained interviewers, (2) by distribution of self-administered forms to 1,300 library users at the main library and its branches, and (3) by mail to all library system staff. All questionnaires were designed to elicit patterns of usage, users, and uses. Recommendations based on the findings of these studies concentrated on improvement of library funding, restructuring and reduction of the library system, the construction of a new main facility, and the limitation or curtailment of some marginally effective programs. Appendices include the methodology, results, and survey questionnaires.

N82-30131/8 PC **A03**/MF **A01**
Council of State Governments, Lexington, KY.
Pilot Study of the Domestic Information Display System in State and Local Government.
Final Report.
Mar 82, 42p NASA-CR-169191, NAS 1.26:169191
Contract NASW-3368

An interactive computer based system that can retrieve a wide range of data (demographic, environmental, socio-economic, etc.,) from a large data base and display these data for different geographic units in the form of choropleth maps was developed. The system was designed to display statistical information in a geographic format for national policy makers.

PB82-197070 PC**$120.00**
National Technical Information Service, Springfield, VA.
Catalog of Government Patents. Volume 4: Abstracts 1975-80. Volume 5: Indexes 1975-80.
c1982, 1120p
See also Volume 3, PB82-251240.

This catalog was prepared as part of a special effort to have the public and private sectors make better use of U.S. Government inventions. Since many of these inventions are available for exclusive licensing, an opportunity now exists for businesses to take greater advantage of Federal technology. Volumes 4 & 5 cover more than 10,000 inventions covering mechanical devices, chemistry, metallurgy, electrotechnology, nuclear technology, biology and medicine, instruments and optics. Each invention referenced in the catalog contains the following information: (1) Title of invention, (2) Patent number, (3) Patent application serial number, (4) Agency assignee, (5) Inventor (s), (6) Filing and issue dates, and (7) Abstracts. The abstract volume arranges each invention abstract into one of eleven subject categories allowing for easy browsing. Inventions cited within each are further sorted by agency. The index volume contains a subject keyword index and an agency index.

PB82-232745 PC**$12.00**/MF **A01**
National Library of Medicine, Bethesda, MD.
Medical Subject Heading, Tree Structures, 1983.
c1982, 458p NLM-MED-82-04
Supersedes PB81-227472. See also PB82-232752.

All Medical Subject Headings currently in use by the National Library of Medicine's indexers, catalogers, and searchers are arranged in a hierarchical manner showing relationships between broader and narrower terms. Included are minor and geographic descriptors.

PB82-232752 PC**$17.00**/MF **A01**
National Library of Medicine, Bethesda, MD.
Medical Subject Headings, Annotated Alphabetic List, 1983.
c1982, 839p NLM-MED-82-05
Supersedes PB81-227480. See also PB82-232745.

The document is an alphabetic list of all subject descriptors used by indexers and catalogers at the National Library of Medicine. It includes: Subject headings, cross references, geographic headings, non-MeSH terms, check tags, tree numbers, notes for indexers, catalogers, and online searchers.

PB82-251224 PC**$50.00**
National Technical Information Service, Springfield, VA.
Catalog of Government Patents. Volume 1: Chemical and Related Arts 1966-74.
c1981, 430p
See also Volume 2, PB82-251232.
Also available in set of 3 report PC$120.00, PB81-140600.

This catalog was prepared as part of a special effort to have the public and private sectors make better use of U.S. Government inventions. Since many of these inventions are available for exclusive licensing, an opportunity now exists for businesses to take greater advantage of Federal technology. Volume 1 covers more than 4500 inventions broadly related to the field of chemistry including textile treatment, basic chemical synthesis, explosives, fermentation, nuclear processes, compositions, non-metallic shaping, and pharmaceuticals. Each invention referenced in the catalog contains the following information: (1) Title of invention (2) Patent number (3) Patent application serial number (4) Agency assignee (5) Inventor(s) (6) Filing and issue dates (7) U.S. Patent Classification (class/subclass) (8) Abstract and (9) Illustration (when appropriate). The catalog is divided into subject chapters and sections allowing for easy browsing.

PB82-261439 PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Cost-Effective Pretreatment Programs.
Journal article,

Lewis A. Rossman. Aug 82, 17p EPA-600/J-82-222
Pub. in Jnl. of Environmental Engineering Division 108, p665-679 Aug 82.

A method is developed for planning cost-effective control programs for toxic pollutants in municipal treatment systems. It chooses the levels of industrial pretreatment and type of municipal sewage treatment a city can use so that all applicable standards and criteria on sewer discharges, receiving water quality, and municipal sludge quality are met at minimum cost. The problem is formulated as a nonlinear 0-1 integer programming model. An implicit enumeration procedure is developed for its solution. The method is applied to control of five heavy metals in Kokomo, Ind. The economic impact of EPA's national pretreatment policies and alternative water quality goals is studied.

PB82-263088 PC **A05**/MF **A01**
SRI International, Menlo Park, CA.
Methodology for Evaluating Highway Air Pollution Dispersion Models.
Final rept.,
J. R. Martinez, H. S. Javitz, R. E. Ruff, A. Valdes, and K. C. Nitz. Dec 81, 94p TRB/NCHRP-245, ISBN-0-309-03410-8
Also pub. in ISSN-0077-5614. Library of Congress catalog card no. 82-50421. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Report on National Cooperative Highway Research Program.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

This report documents the results of a study whose objectives were to develop methods for evaluating the performance of highway air pollution dispersion models; assemble and document a data base to be used to assess model performance; and perform a preliminary evaluation of selected models to demonstrate the application of methodology. The evaluation methodology comprises both statistical analysis and sensitivity analysis. In the statistical method, six statistics were defined that describe the predictive performance of dispersion models in three complementary categories: ability to predict exceedances of concentration thresholds (which may be equal to ambient air quality standard); ability to track pollutant levels in space and time; and ability to replicate the numerical value of observed concentrations. The six statistics were combined into a single figure of merit that describes the composite performance of the model. The statistical method takes into consideration the presense of error in the measured pollutant concentrations. The formulas for the six statistics have been modified to include the effect of two types of observational error: errors defined as a percentage and errors specified as a constant bound. A computer program was prepared that performs several diagnostic analyses of model performance.

PB82-263476 PC **A04**/MF **A01**
Wisconsin Univ.-Milwaukee. Region V Child Abuse and Neglect Resource Center.
Interdisciplinary Glossary on Child Abuse and Neglect: Legal, Medical, Social Work Terms.
Apr 80, 52p DHHS/PUB/OHDS-80-30137
Grant DHHS-ACYF-90-C-600
Revision of report dated 1978.

To facilitate communication and understanding within and across disciplines, the Midwest Parent-Child Welfare Resource Center at the University of Wisconsin-Milwaukee compiled this Interdisciplinary Glossary. It presents, in a concise and easily accessible format, legal, medical, and social work terms relevant to child abuse and neglect prevention and treatment programs, and provides explanations which will facilitate cross-disciplinary understanding. As such, the authors hope it will prove helpful to: attorneys, day care personnel, family life educators, health care administrators, homemaker personnel, judges, law enforcement personnel, legislators, nurses, parent aides, physicians, psychologists, social planners, social workers, school administrators, teachers, students, volunteer child and family advocates, and concerned citizens in all parts of the country.

PB82-263898 PC **A10**/MF **A01**
Chase, Rosen and Wallace, Inc., Alexandria, VA.
Integration of Telephone Transit Information Systems in Metropolitan New York-New Jersey.
Final rept. Oct 80-Jan 82.
Jan 82, 208p UMTA-NY-06-0077-81-1
Sponsored in part by Port Authority of New York and New Jersey.

The objective of this two-phase study was to determine the feasibility of integrating some, or all, of the seven major telephone information systems in the New York-New Jersey metropolitan area. In this study, the seven major telephone transit information systems in the area were studied in detail, and individual improvements were identified for each center. The demand for information concerning multi-mode trips was estimated based on ridership characteristics and telephone center inquiry rates. Five conceptual levels of integration were developed and analyzed in terms of numbers of calls saved and number of calls handled. Design specifications, implementation procedures and cost and commitment estimates were proposed for selected short-range improvements at each center.

PB82-875717 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Word Processing Equipment and Applications. 1976-September, 1982 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Sep 82.
Sep 82, 258p
Supersedes PB81-880205.

This bibliography contains citations concerning word processing office applications and equipment variations. Laser printers, phototypesetting, ink jet printing, fully automated records management, and digital equipment utilized in conjuction with word processing are among the topics presented. Applications of word processing systems to reduce office management costs are discussed. (This updated bibliography contains 202 citations, 61 of which are new entries to the previous edition.)

PB82-875915 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Output to Microfilm (COM). 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 275p
Supersedes PB82-855677.

This bibliography contains citations concerning concepts, techniques, equipment, and systems for computer output to microfilm (COM) and allied technology employed in a wide variety of applications. Some attention is given to economic considerations of COM. Coverage is worldwide. (This updated bibliography contains 340 citations, 49 of which are new entries to the previous edition.)

PB82-876186 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Bibliographies, Abstracts, and Literature Surveys Published by the Military. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 116p
Supersedes PB82-853334.

This bibliography contains citations concerning literature surveys, abstracts, and bibliographies published by the military for both military and civilian usage. A wide variety of topics are covered. (This updated bibliography contains 116 citations, 33 of which are new entries to the previous edition.)

PB82-928037 PC **E02**
Central Intelligence Agency, Washington, DC.
Maps: Africa; Middle East.
Apr 82, 6p
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-928000.

The Political maps of Africa and the Middle East have populated places and differentiated color tones for countries. Map scales vary.

PB82-928039 PC **E02**
Central Intelligence Agency, Washington, DC.
Finland (Map No. 58419).
Feb 69, 11p
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-928000.

The document is a detailed reference map of Finland showing populated places, major transportation, terrain with physiographic names and selected elevations. Map scale 1:2,500,000.

5C. Economics

AD-A118 633/7 PC **A03**/MF **A01**
Coates (J.F.), Inc., Washington, DC.
The Consequences of Metric Conversion for Small Manufacturers. Volume I. Summary Report.
Final rept.,
Henry H. Hitchcock, and Joseph F. Coates. 8 Feb 82, 35p
Contract AA-80-SAC-X8604
See also Volume 2, AD-A118 634.

Metric production capability for America's small manufacturers is wide spread but shallow. There has been little costs to firms to produce metric products. Conversion is spurred by demands of current customers. Metric production presents few problems for small manufacturers. The small manufacturers have not benefited from the conversion except to keep the business of their customers that convert to metric. Metric conversion for small manufacturers is neither forced nor timely voluntary. They follow the general trends in the industry they serve. Metric production is considered by small manufacturers as a routine aspect of doing business. (Author)

AD-A118 634/5 PC **A13**/MF **A01**
Coates (J.F.), Inc., Washington, DC.
The Consequences of Metric Production for Small Manufacturers. Volume II. Case Studies of Large Business-Small Business Interaction,
Henry H. Hitchcock, Joseph F. Coates, Marcy M. Canavan, Grant H. Prillaman, and M. Suzanne Nettles. 8 Feb 82, 284p
Contract AA-80-SAC-X8604
See also Volume 1, AD-A118 633.

Over the last decade, controversy, concern, and conjecture have surrounded the effects of metric conversion on small business. Enthusiasts for metric argue that conversion would benefit small businesses in two ways. It would expand their markets -- especially export markets. It would also improve business by making production processes more rational. Dissenters argue that conversion is unnecessary and possibly harmful to the majority of the nation's small businesses. Against this backdrop, the U.S. Metric Board is fulfilling its statutory mission to find out what happens to small businesses that convert to metric. The first phase of the project was a search for small businesses that had made substantial investments in converting to metric. That search showed that small businesses were most likely to invest in metric production in response to large corporations' needs for metric parts and products. The second phase of the research consisted of three case studies of the effects of large companies' conversion on small business suppliers. The team studied how the conversion of a General Electric Company department, two Ford Motor Company product lines, and three divisions of Ingersoll-Rand affected their small business suppliers.

AD-A118 806/9 PC **A02**/MF **A01**
RAND Corp., Santa Monica, CA.
Is Competition the Answer,
Joseph P. Newhouse. Apr 82, 15p Rept no. RAND/P-6744

Proposals for more price competition in medical services delivery have arisen on both sides of the Atlantic. Perhaps the most visible pro-competition spokesman in the United States is Alain Enthoven (1978, 1980), but other names are also prominently associated with the concept (McClure 1978, Havighurst 1980, President's Commission 1980, Greenberg 1981). Recently legislation to promote competition has been introduced in the United States Congress. Periodically, individuals in other parts of the world also unfurl the banner of competition (Lees 1961, Stahl, in press). The remarks that follow are limited to the American context for brevity; some of them would have to be altered in other institutional contexts.

AD-A118 855/6 PC **A05**/MF **A01**
Construction Engineering Research Lab. (Army), Champaign, IL.
The Two-Tier Concept for Economic Impact Analysis: Introduction and User Instructions.
Final rept.,
R. D. Webster, J. W. Hamilton, and Dennis Robinson. Aug 82, 90p Rept no. CERL-TR-N-127

This report describes the two-tier concept for economic analysis of impacts associated with new Department of Defense programs. The first tier is the Economic Impact Forecast System (EIFS), which is used for conducting a preliminary screening of the impacts. The second tier is the Local Economic Consequences System (LECS), which provides a detailed analysis of realignment impacts. Both systems are available through the Environmental Technical Information System. Several other economic impact analysis methodologies were also examined. This study found that a combination of the two-tier concept with the Regional Industrial Multiplier System/Bureau of Reclamation Economic Assessment Model methodologies would provide the best system for analyzing large, sector-specific impacts. General instructions for using EIFS and LECS are provided. (Author) Equations, user input variables, and definitions are also provided.

DE82013979 MF **A01**
New York Univ., NY. Dept. of Economics.
World Oil Model Development. Progress Report No. 2.
D. Gately. 20 Mar 82, 38p DOE/PE/70326-2
Contract AC02-81PE70326
Portions of document are illegible.
Available in microfiche only.

In this second Progress Report, a revised and updated model of the world oil market is described. Section II lists the variables and equations in the model. Illustrative projections are presented in Section III. The model's historical results are compared with actual historical data for 1973 to 1980. (ERA citation 07:042300)

DE82902600 MF **A01**
Comision Economica para America Latina, Santiago (Chile). Div. of Natural Resources and the Environment.
World Oil Prices: Prospects and Implications for Energy Policy-Makers in Latin America's Oil-Deficit Countries.
J. W. Mullen. 1978, 85p NP-2902600
U.S. Sales Only. Available in microfiche only.

This study considers two broad topics: future prices for world crude oil and energy policy in Latin American oil-deficit countries. Chapter I identifies and explains the pattern of world crude oil prices in the post-war era. Chapter II provides an analysis of the structure of today's world crude oil market from the point of view of price formation. Chapter III discusses the current pattern of energy policies in the industrialized, oil-importing countries. Again, the emphasis is on price formation. Chapter IV focuses on the price forecast. It opens with an estimate of the maximum level of the long-run incremental cost of supplying world oil over the next two decades. Chapter V deals with the range of options open to policy-makers in Latin America's oil-deficit countries as they confront the expected price of world crude oil. It closes with a discussion of the security of oil imports in Latin America's oil-deficit countries. (ERA citation 07:045707)

DE82903703 PC **A02**/MF **A01**
South Dakota Chamber of Commerce, Pierre.
Good News for Your Business: Ideas on How to Reduce Energy Costs, Get Investment Tax Credits, and Free Help.
1981, 19p NP-2903703

Energy conservation programs at ten businesses in South Dakota are explained. Information is provided on special features and implementation, benefits and savings, and the name of a contact person if specific details of the program are desired. A list of other South Dakota businesses practicing energy conservation is included. A list of architects and consulting engineers who have expertise in the field of energy conservation and a bibliography of materials providing additional information are also included.

DE82903704 PC **A03**/MF **A01**
Arizona Energy Office, Phoenix.
Energy and Related Laws: An Annotated Compilation of Federal and State Laws Having Potential Impact on Energy Use and Development in Arizona. Research Report No. 012.
W. Crimmins. Jul 81, 39p NP-2903704

Short summaries are given of Public Laws of the United States, the United States Code, and the Arizona Revised Statutes (through April 30, 1981) which affect energy consumption and development. Laws dealing with public power systems, conventional fuel-based power systems, nuclear power, renewable energy-based power systems, synfuels, hydrogen, conservation (direct reduction methodologies), transportation of fuels, and environmental laws are included.

HRP-0904316/7 PC **A06**/MF **A01**
Institute for Health Planning, Inc., Madison, WI.
Financial Positioning for Survival,
Carol V. Getts. Jul 82, 103p
Contract PHS-HRA-232-79-0036

This document examines how hospitals currently gain access to private capital and explores the actions hospitals can take to improve their access to the traditional private capital markets. The document begins with a brief review of the history of hospital capital financing and explores in more detail the ramifications of current and anticipated changes in government policies. Then, an overview of current hospital private capital options and the general methods of hospital credit assessment used for each are presented. Following this overview, specific focus is given to the variables used to evaluate hospitals for tax-exempt revenue bonds. This specific capital option was chosen for in-depth review because it presently represents the largest source of hospital capital, and because the techniques applied in this instance are among the most rigorous and best documented of any hospital capital finance option. Following this examination of the key credit assessment variables, several ways in which hospitals can improve their financial standing, and hence improve their ability to access capital, are discussed.

PB82-253683 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. International Economics Div.
Consortium on Trade Research: Agricultural Import Demand in Low-Income, Middle-Income, and Centrally Planned Countries.
Foreign agricultural economic rept.,
T. Kelley White, George E. Rossmiller, and Vernon Sorenson. Aug 82, 41p FAER-173
See also PB81-129983.

During the seventies, demand for agricultural imports increased substantially in low- and middle-income countries and the centrally planned countries. Further growth in such demand will depend on internal policy decisions and domestic and international economic conditions of these countries. State trading, food reserves, and bilateral agreements are becoming increasingly important in international agricultural trade. The third meeting of the Consortium on Trade Research focused on agricultural import demand in the developing and centrally planned countries and the policies and economic conditions affecting that demand.

PB82-255746 PC **A03**/MF **A01**
Haliwa-Saponi Tribe, Hollister, NC.
Understanding and Implementing Economic Development for a Rural Indian Community - Final Report 1982,
Arnold Richardson, and Kathy Wilson. 1982, 37p EDA-82-0053
Grant EDA-04-06-18005-01

The Overall Economic Development Plan for the Haliwa-Saponi Tribal Community is developed to address the problems of the American Indian people residing in the rural areas of Halifax and Warren County, North Carolina who are in the unemployed and low income category due to the very rural location and non-existence of industrial development.

PB82-255936 PC **A15**/MF **A01**
Navajo Tribe, Window Rock, AZ. Div. of Economic Development.
Current Feasibility Analyses Regarding Shopping Center Developments in Selected Communities within the Navajo Nation, Arizona.
May 82, 330p EDA-82-0055
Grant EDA-07-6-02252
Prepared in cooperation with John D. Herbert and Association, Phoenix, AZ.

The studies in this report were performed in response to a request for three market feasibility analyses in selected communities within the Navajo Nation by the Business Management Department of the Division of Economic Development. The market feasibility analyses were requested to assist in the planning of shopping center developments in the communities of Tuba City, Kayenta and Shiprock. These proposed shopping centers would serve the Navajo Nation's emerging urban concentration growth areas and promote economic development within their respective regions of the Reservation.

PB82-257262 PC **A05**/MF **A01**
Hulman Regional Airport Authority, Terre Haute, IN.
Industrial Park Feasibility Study: Hulman Regional Airport, Hulman Regional Airport Authority, Terre Haute, Indiana.
Jun 82, 83p EDA-82-0048
Grant EDA-06-06-01811-40
Prepared in cooperation with Stanley Consultants, and R. W. Armstrong and Associates, Inc., Indianapolis, IN.Color illustrations reproduced in black and white.

This study examines existing facilities, land use, and improvements needed to develop an area adjacent to the Hulman Regional Airport into an industrial park. Encouraging industrial development in the Hulman Regional Airport area will potentially create new jobs and employment opportunities in the community, reduce the number of poverty-level persons in the county, and create potential for increasing per capita income. The study examines existing and needed utilities and improvements for future planned physical, economic, and industrial growth in the area. The study incorporates objectives of the West Central Indiana Economic Development District's Overall Economic Development Program.

PB82-257338 PC **A06**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.
Federal Review of Intrastate Branching Applications Can Be Reduced,
Report to the Congress.
24 Feb 82, 111p GGD-82-31

This report describes the processes used by the Federal bank regulators to review commercial banks' applications for branches and makes recommendations for reducing the burden imposed by those processes. The recommendations include changes to existing laws which would minimize and, in some cases, eliminate the Federal review of commercial bank branching.

PB82-257775 PC **A04**/MF **A01**
East Ninth Street Community Development Corp., Chattanooga, TN.
M. L. King Boulevard Study, Chattanooga, Tennessee.
Apr 82, 60p EDA-82-0052

The East Ninth Street Development Corporation (ENSCDC) realized that while living conditions in the M. L. King Boulevard (formerly East Ninth Street) neighborhood had been deteriorating through the years, the people who lived, worked and shopped there wanted to see the community regain the prominence and pride that it once had. Two planning studies were available which provided current information about the area. With the technical assistance, several design workshops were held in the neighborhood and involved neighborhood residents. Many helpful comments were received from the neighborhood partici-

pants and were made part of the information available for the revitalization plan.

PB82-258211 PC **A05**/MF **A01**
Memphis State Univ., TN. Regional Economic Development Center.
The Regional Economic Development Center, Memphis State University - Final Report 1980-1981.
Final rept. 1 Jul 80-31 Dec 81.
Jul 82, 82p EDA-82-0050
See also report for 1979-80, PB81-123226, and report for 1975-76, PB-263993.

The REDC represents the University in its 'outreach' or service to the region in the field of developmental planning. The Center's main objective is to accelerate the development process. This means building and investing today in those job-producing activities that would otherwise receive little or no attention, perhaps for several years. Assistance is provided to both the public and private sectors. Assistance is provided to local governments to help upgrade their public facilities base in support of immediate and future development, and technical assistance is provided to small and medium-size private enterprise clients in Middle and West Tennessee.

PB82-258427 PC **A06**/MF **A01**
General Accounting Office, Washington, DC. General Government Div.
The Federal Reserve Should Move Faster to Eliminate Subsidy of Check Clearing Operations.
Report to the Congress.
7 May 82, 110p GGD-82-22

The Monetary Control Act of 1980 required the Federal Reserve to begin charging in 1981 for selected services that used to be provided free to member banks. This report examines how the Federal Reserve implemented pricing for clearing checks and for clearing payments electronically--two services that together account for more than one-third of the operating budgets of Federal Reserve banks.

PB82-258559 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. International Div.
Examination of Fiscal Year 1981 Overseas Private Investment Corporation Financial Statements and Related Issues.
16 Aug 82, 48p GAO/ID-82-33

The overseas Private Investment Corporation's fiscal year 1981 financial statements present fairly the corporation's financial position at September 30, 1981, and its operating results for the year then ended. GAO found that the Corporation's insurance and guaranty reserves appear to be adequate to cover existing commitments, the Corporation did not fully disclose the effects of delinquent project financing in its statement, and tighter control and monitoring of the Corporation's administrative expenditures were needed. GAO's recommendations are aimed at improving the Corporation's financial disclosures and oversight of its activities.

PB82-259102 PC **A03**/MF **A01**
Energy Resources Co., Inc., Vienna, VA.
Railroad Cash Flow Model Software Documentation. Volume 1: Cash Flow Model Description.
Final rept.
Jan 82, 50p EPA-550/9-82-204-A
Contract EPA-68-01-6093
See also Volume 2, PB82-259110.Portions of this document are not fully legible.
Also available in set of 3 reports PC E99, PB82-259094.

This document describes the cash flow model used in the financial analysis conducted for the background document to railroad yard noise standards. It first details the purpose of the cash flow model. Next, a derivative to the equations used in the model is presented. Volume II lists the data inputs needed to use the model. Finally, a sample output of the model is shown with notes on how to interpret it.

PB82-259110 PC **A04**/MF **A01**
Energy Resources Co., Inc., Vienna, VA.
Railroad Cash Flow Model Software Documentation. Volume 2: Case Flow Model User's Guide.
Jan 82, 57p EPA-550/9-82-204-B
Contract EPA-68-01-6093
See also Volume 1, PB82-259102, and Volume 3, PB82-259128.Portions of this document are not fully legible.
Also available in set of 3 reports PC E99, PB82-259094.

This volume of the railroad cash flow software documentation describes the use of the railroad cash flow model. It tells how to access the model and how to change the data. Section 2.1 provides a brief overview of the design of the cash flow model and the computing environment it is used in. Section 2.2 describes how to access the computer and run the model. Section 2.3 shows how to change the data. Section 2.4 is a sample output. Appendix A is a sample session with the cash flow model. Appendix B is a list of key commands which can be used on the WYLBUR system. Appendix C explains how to restore files which have been achieved.

PB82-259128 PC **A04**/MF **A01**
Energy Resources Co., Inc., Vienna, VA.
Railroad Cash Flow Model Software Documentation. Volume 3: Cash Flow Model Programmer's Manual.
Final rept.,
Jan 82, 70p EPA-500/9-82-204-C
Contract EPA-68-01-6093
See also Volume 2, PB82-259110.Portions of this document are not fully legible.
Also available in set of 3 reports PC E99, PB82-259094.

This manual provides information on how to service the cash flow model. It is written for a user who has some familiarity with standard IBM FORTRAN-IV and the WYLBUR system. The manual has four sections. The first section discusses the model design through its technical specifications, data requirements and algorithms. The second section defines the data base specifications and defines the data names. The third section is an annotated listing of the program. The fourth section describes verification and test procedures for the model.

PB82-259441 PC **A02**/MF **A01**
Maxwell School of Citizenship and Public Affairs, Syracuse, NY.
Balanced Urbanization, Spatial Integration, and Economic Development in Asia: Implications for Policy and Planning,
Dennis A. Rondinelli. 1980, 19p AID-PN-AAH-806
Contract AID/TA-C-1356

Although 12 of Asia's metropolitan centers are among the world's 35 largest cities, and half of all Asians are expected to be urbanites by the year 2000, this report on urbanization and spatial patterns in East and Southeast Asia argues that it is not the pace but the pattern of urbanization which poses problems for developing countries.

PB82-259763 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
The Effects of the Competitive Structure of Financial Institutions on Rural Bank Performance and Economic Growth.
Staff rept.,
Daniel L. Milkove, and David B. Weisblat. Apr 82, 32p AGES-820226

The competitive structure of local financial markets was not a factor in explaining 1973-1977 employment growth in a sample of 220 nonmetropolitan counties. Loan-to-deposit ratios of commercial banks also failed to explain employment growth. The study did support the hypothesis that bank performance is affected by the degree of local financial competition. Banks participating in more competitive markets had higher loan-to-deposit ratios and lower net income-to assets ratios.

PB82-260167 PC **A02**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Rural Financial Markets and Development in Low Income Countries: Some Insights for the U.S.
Occasional paper,
Dale W. Adams. 5 Mar 80, 20p OP-712, AID-PN-AAH-880
Contract AID/ta-BMA-7

Despite the prosperity of U.S. rural financial markets (RFM), recent criticism has been aimed at developing country RFM's patterned after U.S. models. This paper explains why developing country RFM's have excluded small rural borrowers and identifies similar trends now appearing in U.S. RFM's.

PB82-260266 PC **A05**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Local Organization Dimensions of Rural Development in Turkey: Socio-Economic Stratification, Orientations Toward Participation, and Attitudinal Modernity,
Halil Copur. Apr 80, 87p RLO-5, AID-PN-AAJ-644
Contract AID-ta-BMA-8

Although Turkey's agricultural sector employs 75% of its people and accounts for nearly all its exports, the country's overall economic development requires strenous efforts to raise rural productivity, boost agriculture's contribution to GNP, and achieve more equitable distribution of rural incomes. Such are the conclusions of this study, performed under the auspices of Cornell University's Rural Development Committee, aimed at finding correlations between the socioeconomic and attitudinal composition of rural organizations and the development of the agricultural sector.

PB82-260316 PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Funding and Viability of Rural Development Banks.
Economics and Sociology occasional paper,
Compton Bourne, and Douglas H. Graham. Apr 80, 30p OP-720, AID-PN-AAH-892
Contract AID/ta-BMA-7

Using the Jamaican Development Bank as an example, this paper examines the impact of existing funding sources on the viability of rural development banks (RDB) in low-income countries and suggests new sources for RDB funding.

PB82-260324 PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
Recent Performance of Rural Financial Markets in Low Income Countries.
Occasional paper,
Dale W. Adams. 11 Apr 79, 30p OP-596, AID-PN-AAH-887
Grant AID/ta-BMA-7

Despite a substantial expansion in the past 30 years, rural financial markets (RFM) have contributed little to development in low-income countries. To bolster this controversial thesis, this paper reviews the recent poor performance of RFM's and identifies its causes.

PB82-260357 PC **A10**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Animation Rurale and Rural Development: The Experience of Senegal,
Sheldon Gellar, Robert B. Charlick, and Yvonne Jones. Oct 80, 224p AR-2, AID-PN-AAJ-634
Contract AID/ta-BMA-8

After 20 years (1959-79), the theory of 'Animation Rurale' (AR), which emphasizes cooperative village control of economic institutions, has been discarded as a basis for rural development planning in Senegal. To explain this abandonment, this study traces, in the light of Senegal's rural development context and AR theory/methodology, the history of AR in Senegal, the AR techniques used, and AR's use in specific regions.

PB82-260399 PC **A04**/MF **A01**
ICF, Inc., Washington, DC.
Alaska Natural Gas Development - An Economic Assessment of Marine Systems. Volume 1: Final Report,
William F. Hederman, Jr. Sep 82, 75p MA-RD-940-82082
Contract MA-81-SAC-10047
See also Volume 2, PB82-260407.

Over the last several years, the U.S. Maritime Administration (MarAd) has supported engineering analyses of both ice-breaker tanker and barge-mounted chemical processing systems. This analysis evaluates the commercial viability of using such marine systems to exploit Alaska gas reserves, especially Prudhoe Bay gas--a large reserve with the nearest term prospects.

The study has two major parts, a market analysis and cost estimation. The market analysis estimates the value that Alaska natural gas or gas products would have in two important markets, fuels and fertilizers. The fuel market analysis relies on much of ICF's work in support of the Department of Energy's natural gas deregulation initiatives and ICF's world oil model, which was recently expanded to incorporate natural gas trade as well. The potential for dedicating Alaska gas to transportation fuel use as either methanol or compressed natural gas receives special attention.

PB82-260407 PC **A10**/MF **A01**
ICF, Inc., Washington, DC.
Alaska Natural Gas Development - An Economic Assessment of Marine Systems. Volume 2: Appendices.
Rept. for Sep 81-Aug 82,
W. F. Hederman, T. R. Breton, R. Hauptman, Z. Rosenberg, and W. Lindsay. Sep 82, 215p MA-RD-940-82083
Contract MA-81-SAC-10047
See also Volume 1, PB82-260399.

Over the last several years, the U.S. Maritime Administration (MarAd) has supported engineering analyses of both ice-breaker tanker and barge-mounted chemical processing systems. This analysis for MarAd evaluates the commercial viability of using such marine systems to exploit Alaska gas reserves, especially Prudhoe Bay gas--a large reserve with the nearest term prospects. This volume contains the appendices supporting the final report.

PB82-262080 PC **A08**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Structural Adjustment of the Food Industries of the United States.
Staff rept.,
John M. Connor. Jul 82, 162p AGES820723

The United States has the largest food manufacturing sector of any market economy of the world. The number of food manufacturers declined by 52 percent between 1974 and 1977. On average, the top four firms control over half of sales in processed-foods product classes; this concentration rose by 10 percent between 1958 and 1977. Product diversification has accelerated. Total food and beverage advertising and sales promotion expenditures ranged between $9 billion and $14 billion in 1979. These elements of market organization affect food-industry economic performance: profit margins, manufacturers' prices, and technological change. About half of the food industries exhibit significant performance problems.

PB82-262825 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
Cordwooding: What's It Costing Us,
Staff rept.,
Gerald Schluter, and Kenneth C. Clayton. Jul 82, 23p AGES820714

Cordwooding, the practice of selling a low value product when markets exist for higher value forms of the product, describes some groups' views of U.S. agricultural trade. Over three-fourths of the value of agricultural exports in recent years has been raw grains and oilseeds. The authors employ an input-output based analysis to estimate the potential fiscal level and timing of the effect on the federal government of exporting more of these products in processed form. Sizeable potential fiscal benefits to the federal government could result from a greater proportion of processed products in the mix of U.S. agricultural exports.

PB82-262874 PC **A03**/MF **A01**
Economic Research Service, Washington, DC. National Economics Div.
A Comparison of Multivariate Logit and Translog Models for Input Demand Studies.
Staff rept.,
Thomas J. Lutton, and Michael R. LeBlanc. Aug 82, 30p AGES-820810

A multivariate logit model of input demand is presented as an alternative to the translog cost share specification. The logit formulation avoids the problem of obtaining shares outside the zero-one interval for values of input prices outside the sample. Unlike the translog share system, the logit system need not be specified monotonic in factor prices. The logit share system is estimated for the food processing sector using a maximum likelihood technique. Homogeneity and symmetry contraints are imposed on the estimated system. The estimated model does not impose rigid a priori restrictions on the elasticities of substitution nor does it force the input elasticities to be a linear function of a price ratio.

PB82-263260 PC **A10**/MF **A01**
Department of the Treasury, Washington, DC.
United States Participation in the Multilateral Development Banks in the 1980s.
Feb 82, 215p

The study focuses on four institutions--the World Bank Group, the Inter-American Development Bank, the Asian Development Bank, and the African Development Bank. The first part of the assessment discusses the role of the MDBs in the international economic system, criticisms of the MDBs, the contribution of MDBs to U.S. interests, the ability of the United States to exercise effective leadership within the MDBs, and the development rational which is the proposed basis for improving MDB effectiveness. The second part of the assessment provides policy recommendations for future U.S. participation in the MDBs and illustrates the relationship between this policy direction and the lending operations of the MDBs. Appendices describe the structure and operations of the MDBs, assess the economic/financial situation of the developing countries over the next several years, and survey and evaluate in detail the criticisms made of MDBs.

PB82-263500 PC **A04**/MF **A01**
National Research Council, Washington, DC. Committee on National Urban Policy.
National Policy and the Post-Industrial City: An International Perspective.
Royce Hanson. 1982, 67p
Sponsored in part by German Marshall Fund of the United States, Washington, DC., and Department of Housing and Urban Development, Washington, DC.

Report on an international conference held by the Committee on National Urban Policy, December 13-14, 1981. European and American conferees discussed the relationships among national economic policies, policies concerned with urban or regional conditions, and policies that address particular industries or sectors of the economy. Short talking papers by the European and Japanese participants are included.

PB82-263930 MF **A01**
Department of Commerce, Washington, DC.
Business America - The Magazine of International Trade, Volume 5, Number 18, September 6, 1982.
Biweekly pub.
6 Sep 82, 41p
See also Volume 5, Number 15, PB82-248766.
Paper copy available from Supt. of Docs.

Among the articles featured in this issue are: Export Strategies For Small Business; New Approach To Overseas Trade Fairs; Morocco, Algeria, and Egypt Seek Scarce Water; U.S. Strengthens Business Ties With Cameroon; and Japanese Market For Leisure-Time Equipment.

PB82-263989 Not available NTIS
National Bureau of Standards, Washington, DC.
New Program to Help Identify Technical Barriers to Trade.
Final rept.,
Joan A. Koenig. Jun 82, 3p
Pub. in Stand. Engineering 34, n3 p55-56, 70 Jun 82.

This article describes a new program established as a result of the Multilateral Trade Negotiation (MTN) Agreement on Technical Barriers to Trade, which was implemented in the United States by Title IV of the Trade Agreements Act of 1979. Under the MTN Agreement (popularly known as the Standards Code) signatory countries are required to notify other signatories of proposed central government mandatory standards that might significantly affect trade. The National Bureau of Standards' procedures for making the required U.S. notifications and disseminating information on notices received from other countries are detailed.

PB82-264946 PC**$21.50**/MF**$21.50**
Partnership for Productivity, Annandale, VA.
Asesoria para Pequenas Empresas (Consultancy for Small Businesses),
Malcolm Harper. 1976, 275p ISBN-0-903031-42-6
Text in Spanish.

Spanish translation of English manual which tries to summarize the results of more than 5 years of providing local economic consulting for small businesses in developing countries. The author initially developed a standard method in Kenya and noted a significant and measurable difference in the administrative capabilities and profitability of most clients. The concept was then applied by the Partnership for Productivity on a rather large scale in western Kenya. Subsequent experiments have been conducted in Brazil, Sri Lanka and Indonesia.

PB82-875097 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Foreign Banking. November, 1974-September, 1982 (Citations from the Management Contents Data Base).
Rept. for Nov 74-Sep 82.
Sep 82, 82p
Supersedes PB81-852410.

This bibliography contains citations concerning international banking, competition of foreign banks, policies on supervision of U. S. branches and agencies of foreign banks, directory of foreign banking in the U. S. A., and foreign bank management. (This updated bibliography contains 117 citations, 32 of which are new entries to the previous edition.)

PB82-875311 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Product Liability and the Manufacturers. 1976-September, 1982 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Sep 82.
Sep 82, 133p
Supersedes PB81-873390.

This bibliography contains citations concerning product liability for manufacturers and their impact on industry. Manufacturer responsibilities, legal aspects of product liability, risk assessment and quality control are discussed. Legislation is considered. Packaging and product liability is emphasized. (This updated bibliography contains 87 citations, 10 of which are new entries to the previous edition.)

PB82-875618 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Developing Countries: Energy Prospects, Progress, and Problems. 1974-September, 1982 (Citations from the Management Contents Data Base).
Rept. for 1974-Sep 82.
Sep 82, 63p
Supersedes PB81-863995.

This bibliography contains citations concerning energy sources, supplies, utilization, and conservation relative to developing countries. Economic, financial, political, and social impacts and ramifications are considered as well. OPEC's role is considered prominently. (This updated bibliography contains 74 citations, 18 of which are new entries to the previous edition.)

PB82-875626 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Product Safety: Industrial and Consumer Impacts. 1976-September, 1982 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Sep 82.
Sep 82, 223p
Supersedes PB81-873408.

This bibliography contains citations concerning consumer as well as industrial impressions and ramifications of product safety. Pharmaceuticals, chemicals, personal care products, foods, household products, and machinery are among the products examined. Legislation and regulations on product standards are included. (This updated bibliography contains 142 cita-

tions, 13 of which are new entries to the previous edition.)

PB82-875998 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Entrepreneurship and Small Business. 1974-September, 1982 (Citations from the Management Contents Data Base).
Rept. for 1974-Sep 82.
Sep 82, 101p
Supersedes PB81-862211.

This bibliography contains citations concerning the theory and practice of entrepreneurship and its role in creating and sustaining small business in general and in specific situations. Interactions between small business entrepreneurs and government and quasi-government organizations are also considered. Coverage is limited to the USA. (This updated bibliography contains 139 citations, 30 of which are new entries to the previous edition.)

5D. History, Law, and Political Science

AD-A118 602/2 PC **A05**/MF **A01**
Newman and Hermanson Co., Washington, DC.
The Impact of Laws on Metric Conversion: A Survey of Selected Large U.S. Corporations.
Final rept.
Feb 82, 94p
Contract MBO-PO-1028

The purpose of the study was to determine the extent to which a sample of the Fortune 1000 firms perceived that legal impediments to metric conversion exists. The Fortune 1000 firms included in the study were: (a) the 41 firms which identified legal impediments to metric conversion in an earlier study report commissioned by the Board, U.S. Metric Board 1979 Survey of Selected Large U.S. Firms and Industries; and (b) 10 additional firms from the industry groups indicating some problems with laws and regulations. This study attempted to make several determinations among which were: whether or not legal impediments or perceptions of legal impediments to metric conversion exist; the correlation between metric planning and the perception that impediments exist; the distribution of perceived impediments among Federal, State and local laws; the nature of corporate lobbying activities; and corporate experiences in addressing legal impediments to conversion.

AD-A118 663/4 PC **A04**/MF **A01**
National Defense Univ., Washington, DC. Research Directorate.
Soviet Intentions and American Options in the Middle East,
Benson Lee Grayson. 1982, 68p Rept no. NATL SEC AFFAIRS MONO-82-3

Contents: The Outlook from Moscow; Afghanistan; Iran; Saudi Arabia; Israel; Egypt; Iraq; Syria; South Yemen; and Soviet Intentions.

AD-A118 749/1 PC **A99**/MF **A01**
Naval Justice School, Newport, RI.
Evidence Study Guide.
Jul 82, 727p

Our discussion of the 'law of evidence' centers primarily upon one decision. That decision is whether or not certain information may be presented to the trier of fact in a legal proceeding. The proceeding with which we are concerned is a criminal trial by court-martial, and the individual initially responsible for making the decision is the military judge detailed to the particular case. In a case in which the accused requests trial by military judge alone, the judge determines whether or not he or she will consider each item of information presented by counsel. In a trial by court members, the judge determines whether the members may hear the information, or, if the members have heard the information prior to an objection, whether the members will be instructed to disregard the information in their deliberations.

AD-A118 817/6 PC **A03**/MF **A01**
Joint Chiefs of Staff, Washington, DC. Special Operations Div.
Soviet News and Propaganda Analysis Based on RED STAR (The Official Newspaper of the Soviet Defense Establishment) for the Period 1-30 June 1982. Volume 2, Number 6.
1982, 46p
See also Volume 2, Number 5, AD-A117 605.

The data in this report reflects Soviet print media emphasis and propaganda trends for over three years -- June 1979 through June 1982. During this period, almost 40,800 feature stories and news items were analyzed. However, the main purpose of this edition is to provide the reader with an overview of Soviet rhetoric, propaganda themes and topics directed to Russian military forces during June 1982. This report contains a summary of propaganda themes from the Russian language newspaper Red Star. With a circulation of several hundred thousand copies, this 'daily' newspaper is the official publication of the Soviet defense establishment. In particular, it represents the views and articulates the issues important to the Main Political Administration of the Soviet Army and Navy, which is responsible for the political reliability of all Soviet military forces. The Main Political Administration receives its guidance directly from the Central Committee of the CPSU.

AD-A118 834/1 PC **A04**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Command Criminal Responsibility: A Plea for a Workable Standard.
Study project,
William G. Eckhardt. 25 May 82, 66p

Professional conduct on the battlefield is the heart of military professionalism. The need for appropriate articulation of expected battlefield conduct is the theme of this project. The unresolved issues and nonexistence of inarticulateness of the current standards are explored using as a medium the Medina case which arose from the tragic My Lai incident. Current standards are compared with standards found in the new proposed Protocols to the Geneva Conventions. Prior to examining these standards, command criminal responsibility is defined, reasons for its examination are explored, and the timeliness of its debate is discussed. The objective of this essay is to examine its international and domestic aspects of command criminal responsibility in an effort to facilitate understanding and intelligent dialogue between commanders and lawyers. (Author)

AD-A118 835/8 PC **A05**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Militarism and Foreign Conflict Behavior: A Quantitative Study Revisited.
Study project,
David G. Hansen. 20 May 82, 95p

Considerable information has been written about the phenomenon known as militarism; however, little or no quantitative research has been used to investigate it. This study surveyed the political, cultural and economic qualities of nations and used seven 1978 indicators to profile the militaristic nature of 139 nations in 1978 and 1979. Since the study's thesis is that nations characterized as militaristic will act more aggressively in their foreign conduct, conflict behavior for these same nations is ascertained and the results manipulated by various statistical techniques. It was found that militarism can best be understood by the economic and social attributes of a nation since the political variables correlated very poorly with foreign conflict. Although an attempt was made to predict future conflict, the results were not conclusive. Concluding observations include that militarism can be quantified and with the use of computer models, future foreign conflict can be determined for certain nations. The results are encouraging, but mixed, and further quantitative research into the mystery of militarism is warranted. (Author)

PB82-265547 PC **A18**/MF **A01**
Maryland Univ., College Park.
From Hand Craft to Mass Production: Men, Women and Work Culture in American Cigar Factories, 1900-1919.
Final rept.,
Patrica A. Cooper. 1981, 405p MD-CMU-2
Grant DL-91-24-79-17
Doctoral thesis.

The study reconstructs and interprets the work culture of two groups of American cigar makers between 1900 and 1919--skilled, male craftsmen, members of the Cigar Makers' International Union and less skilled females working under a division of labor. Male unionists worked in small shops and resisted any division of labor. Non-union manufacturers restructed work and hired women and large companies increasingly dominated the industry. Work culture expresses both workers responses to and influence on the transformation of the industry during these years. The special conditions prevailing during World War I provided cigar makers with opportunities to win wage increases and shop demands: Briefly both groups, hitherto antagonists, joined together, united by goals which related to their differing work cultures. Labor militancy and a united labor force threatened union and non-union manufacturers. However, the dramatic entrance of new and revolutionary technology in 1919 signified manufacturers' superior power and paved the way for the introduction of a new group of workers with no previous ties to the industry.

5E. Human Factors Engineering

AD-A118 713/7 PC **A02**/MF **A01**
Human Engineering Lab., Aberdeen Proving Ground, MD.
Some Human Factors Considerations in the Design of a Combat Rifle.
Final rept.,
Paul H. Ellis. Jul 82, 14p Rept no. HEL-TN-7-82

This report presents views on some of the human factors considerations in the design of a modern combat rifle. It draws upon testing and the experience of people at the US Army Human Engineering Laboratory who have been involved in small arms research and development during the last 25 years. A figure is included showing a hypothetical combat rifle configuration embodying desirable human factors characteristics. (Author)

PB82-875352 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Anthropometry. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 83p
Supersedes PB80-851199.

This bibliography contains citations concerning modelling to predict the anthropometric, biomechanical, and work physiology parameters for age, height, and weight. The human engineering of man/equipment systems are considered. (This updated bibliography contains 78 citations, 26 of which are new entries to the previous edition.)

5F. Humanities

AD-A118 563/6 PC **A06**/MF **A01**
Iroquois Research Inst., Fairfax, VA.
Cultural Resources Survey of Three Mississippi River Levee and Revetment Items, Plaquemines Parish, Louisiana.
Final rept.,
John D. Hartley, Adam G. Garson, Cecil R. Brooks, Douglas H. Edsall, and Patricia B. Eggleston. Mar 82, 102p Rept no. PD-RC-82-08
Contract DACW29-80-D-0107

In September of 1980, Iroquois Research Institute conducted an archeological survey of three levee and revetment items on the Mississippi River in Plaquemines Parish, Louisiana. Two historic sites were discovered. One consisted of an inlet and possible fragmentary wharf located in the Bohemia Revetment. At the Harlem Levee Setback, brick scatters, in situ brick remains, and a large standing house were identified within the project right-of-way. The remains at the Harlem Setback are probably associated with the Old Harlem Plantation and are potentially significant to local and regional history and to historic archeology. (Author)

AD-A118 564/4 PC **A08**/MF **A01**
Iroquois Research Inst., Fairfax, VA.

Cultural Resources Survey of Fourteen Mississippi River Levee and Revetment Items.
Final rept.,
Adam G. Garson, Cecil R. Brooks, Nancy N. Brown, Douglas H. Edsall, and Edwin A. Lyon, II. 14 Apr 82, 160p Rept no. PD-RC-82-09
Contract DACW29-80-D-0107

In May and June of 1981, Iroquois Research Institute performed a cultural resources survey of fourteen Mississippi River levee and revetment items in Iberville, St. James, St. Charles, Orleans, St. Bernard and Plaquemines Parishes, Louisiana. The project included a prehistoric and historic background study and literature search, a geomorphological analysis of the survey items, and a systematic archeological survey. Fourteen historic sites were inventoried during the systematic survey. They included a catwalk, a furnace, a wooden platform, two sites containing brick house supports, a residential complex, a canal laock, two possible pump house sites, a navigational light base, a riverside railroad terminal, and a subsurface site. No prehistoric sites were discovered. Recommendations were made for two sites, one containing 18th-19th century ceramics, and the other a canal lock. The ceramic site was evaluated as potentially eligible for nomination to the National Register of Historic Places. Further testing was recommended to determine its potential eligibility. At the canal lock, the Institute recommended the placement of an historic marker. (Author)

AD-A118 565/1 PC **A10**/MF **A01**
Iroquois Research Inst., Fairfax, VA.
Cultural Resources Survey of Three Mississippi River Levee Setbacks and Borrows.
Final rept.,
Adam G. Garson, Lawrence L. Black, Cecil R. Brooks, Nancy N. Brown, and Eugene Cizek. 30 Apr 82, 209p Rept no. PD-RC-82-10
Contract DACW29-80-D-0107

In June of 1981, Iroquois Research Institute performed a cultural resources survey of three Mississippi River Levee Setback and Borrow items in Plaquemines Parishes and St. Bernard Parishes, Louisiana. The project included a prehistoric and historic background study and literature search, a geomorphological analysis of the survey items, and a systematic archeological survey. Intensive historic research aimed at determining the location of Fort St. Mary at English Turn in Plaquemines Parish was also performed. A total of 19 historic sites were inventoried during the survey. They included 18 residential, commercial, and religious buildings and the possible archeological remains of one plantation house. Recommendations for further study were made for the Palazzo Grocery Store at Linwood and for St. Luke's Baptist Church at Scarsdale-Stella. A feasibility study was recommended for making part of Arabi, including the area to be adversely affected by the levee setback, an historic district. The effect of an historic district would be to preserve historic archeological remains and the integrity of the many 19th and early 20th century structures existing in the area. The results of the historic study of Fort St. Mary indicated that there would be only a slight possibility that borrowing by the Corps of Engineers would adversely affect the remains of the fort. Its present location appears to be on the landward side of the levee below Shingle Point. (Author)

AD-A118 568/5 PC **A05**/MF **A01**
Iroquois Research Inst., Fairfax, VA.
Cultural Resources Survey of Six Revetment and Levee Items Above New Orleans.
Final rept.,
John D. Hartley, Cecil Brooks, Douglas H. Edsall, Patricia B. Eggleston, and Adam G. Garson. 20 Jan 82, 93p Rept no. PD-RC-82-07
Contract DACW29-80-D-0107

In September of 1980, Iroquois Research Institute conducted an archaeological survey of six revetment and levee items on the Mississippi River in Ascension, Jefferson, St. James, St. John the Baptist, and St. Charles Parishes, Louisiana. Five historic sites were discovered including the wooden hull of a ship, a wooden retaining wall, a modern concrete foundation, a trash dump, and an eroding brick scatter. Modern debris scatters were evident along the bank and batture throughout the project area. None of these sites is recommended to the National Register of Historic Places, and no further testing is recommended at the sites. (Author)

AD-A118 569/3 PC **A99**/MF **A01**
University of Southwestern Louisiana, Lafayette. Center for Archaeological Studies.
Archeology and Ethnology on the Edges of the Atchafalaya Basin, South Central Louisiana. A Cultural Resources Survey of the Atchafalaya Basin Protection Levees.
Final rept. Jun 79-Jan 82,
Jon L. Gibson. Jan 82, 643p Rept no. PD-RC-82-04
Contract DACW29-79-C-0265

A cultural resources survey of the East and West Atchafalaya Basin Protection Levees investigated a total of 33 prehistoric and historic sites. Indian sites ranged in age from Archaic to Plaquemine, and historic sites from Contact to twentieth century. Ethnographic research showed the complexity of ethnic identity and the powerful influence of the Atchafalaya swamp in molding a rather unique subculture. A total of 12 cultural resources was recommended as significant, and mitigation recommendations were tendered. (Author)

AD-A118 797/0 PC **A08**/MF **A01**
Great Lakes Archaeological Research Center, Inc., Waukesha, WI.
Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Volume I.
Reports of investigation no. 115,
Robert F. Boszhardt, and David F. Overstreet. Dec 81, 160p
Contract DACW25-81-C-0045
Original contains color plates: All DTIC and NTIS reproductions will be in black and white. See also Volume 2, AD-A118 798 and Addendum, AD-A118 799.

In March, 1981, Great Lakes Archaeological Research Center, Inc. entered into a contractual agreement with the Rock Island District Corps of Engineers to conduct a cultural resources survey on Corps owned or administered lands within Navigation Pool 12 in the Mississippi River. In its initial form the project identified two primary goals: (1) generate a qualitative predictive model for site locations; and (2) evaluate the effects of erosion from maintenance of the pool on cultural resources within the pool. The second goal of the project, to evaluate the effects of pool maintenance of cultural resources, has been realized. Fifteen of the 24 archaeological sites located through this preliminary survey and evaluation are currently being destroyed by erosional processes at work in the lowland floodplain. Finally, past conceptualizations of the utilization and occupation of the lowland floodplain by prehistoric residents need to be re-examined.

AD-A118 798/8 MF **A01**
Great Lakes Archaeological Research Center, Inc., Waukesha, WI.
Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Volume II. Technical Documents and Site Data Sheets.
Reports of investigation no. 115.
1981, 143p
Contract DACW25-81-C-0045
See also Volume 1, AD-A118 797 and Addendum, AD-A118 799.
Availability: Microfiche copies only.

The purpose of this contract is to obtain a cultural resources survey and report for Pool 12 of the Mississippi River. The work will be a 100 percent cultural resource inventory of selected areas in Pool 12 in compliance with Executive Order 11593 and Public Law 93-291. The objective is to generate a qualitative predictive model for site locations and to evaluate the effects of erosion from maintenance of the pool on the cultural resources within the pool. (Author)

AD-A118 799/6 MF **A01**
Great Lakes Archaeological Research Center, Inc., Waukesha, WI.
Preliminary Investigations: Archaeology and Sediment Geomorphology, Navigation Pool 12, Upper Mississippi River. Addendum: Archaeological Testing and Evaluation of 11Jd126.
Reports of investigation no. 115,
Robert F. Boszhardt, and David F. Overstreet. Feb 82, 197p
Contract DACW25-81-C-0045
Addendum to Volume 1, AD-A118 797 and Volume 2, AD-A118 798.
Availability: Microfiche copies only.

On November 19, 1981, the Great Lakes Archaeological Research Center, Inc. was notified by the Rock Island District Corps of Engineers to proceed with evaluatory testing at 11Jd126, a threatened archaeological site in the lowland floodplain of Navigation Pool 12 in the Mississippi River. The evaluation was geared towards determination of the sites eligibility to the National Register of Historic Places. The testing began late in November 1981 and efforts were severely hampered by poor field conditions. However, in the short amount of time expended at the site, it became clear that the site likely meets the criteria for eligibility to the National Register. In situ deposits consisting of a sheet midden and pit features were identified as representing Middle and Late Woodland components. The results of the testing have produced the first lowland floodplain adaptive strategy information for these periods within this region.

PB82-258690 PC **A06**/MF **A01**
National Park Service, Denver, CO. Branch of Historic Preservation.
Historic Structure Report: Miller Field, the Seaplane Hangar, (Building No. 38) Historical Data and Archeological Data, Gateway National Recreation Area, New York - New Jersey.
Rept. for period 1635-1981,
Harlan D. Unrau, and Jackie W. Powell. Dec 81, 113p FNP-400-82-32

The purpose of this study was to provide sufficient information on the architectural evolution of the hangar to ensure that the stabilization/preservation of the structure is historically accurate. The seaplane hangar at Miller Field is significant as one of the last extant examples of its type remaining on the eastern seaboard. The hangar, as well as the entire complex of buildings at Miller Field, was the product of the post-World War I industrial approach to functional solutions, minimum materials, maximum repetition, and preassembly. The study discusses the early history of the area to the year 1919 when the Air Coast Defense Station was established there. The construction history of the seaplane hangar and modifications to the structure through to 1979 are presented. Drawings and illustrations are included.

PB82-263062 PC **A08**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report for Carl Sandburg Home National Historic Site, Henderson County, North Carolina, Front Lake and Dam, Side Lake and Dam, Pond Bridge, Duck Cage (1836-1980),
C. Craig Frazier, and John C. Paige. Nov 81, 157p FNP-400-82-41

Carl Sandburg Home National Historic Site, established October 17, 1968, consists of 248 acres and is located twenty-five miles southeast of Ashville, in Henderson County, North Carolina. This Historic Structure Report concerns the Dam and Front Lake, HS-39, Dam and Side Lake, HS-40, and Pond Bridge, HS-35, built prior to the Sandburg's occupancy, but enjoyed by them and Duck Cage, HS-34 built by the Sandburgs. Each of these is an important historic scene element in the interpretation of Carl Sandburg's home between 1945 and 1967. The Historic Data Section discusses the pre-Sandburg periods when the land was first occupied by Charles Baring followed by Christopher G. Memminger, the first Secretary of the Treasury of the Confederate States of America. It concludes with the administration of the area by the National Park Service which began in 1968. The Architectural Data Section provides a basis for management decisions concerning the treatment of the 2 historic lakes, their masonry dams, a footbridge, and the duck cage.

PB82-263682 PC **A21**/MF **A01**
Southern Methodist Univ., Dallas, TX. Archaeology Research Program.
Evaluation of Cultural Resources at Brantley Reservoir, Eddy County, New Mexico.
Final rept.,
S. Alan Skinner. 1980, 479p RR-120
Contract DI-5-07-01-X0330

The Brantley Reservoir Archaeological Project tested and evaluated over 30 historic and prehistoric sites.

Mitigative investigations were eventually completed at a few prehistoric sites, but nearly all the historic sites remain uninvestigated. The investigations conducted on the prehistoric sites were guided by a model of prehistoric settlement and subsistence derived from a Mescalero Apache ethnohistoric data base. The model was tested through an examination of prehistoric site morphology and function. A model of intrasite artifact patterning added an additional level of analysis. The resultant framework of prehistoric settlement and subsistence should be applicable over a large portion of southeastern New Mexico.

PB82-265000 PC **A09**/MF **A01**
Texas Univ. at San Antonio.
Excavations at 41 LK 67, A Prehistoric Site in the Choke Canyon Reservoir, South Texas.
Choke Canyon series,
Kenneth M. Brown, Daniel R. Potter, Grant D. Hall, and Stephen L. Black. 1982, 194p
See also PB81-240574.

In 1977-78, excavations were conducted at 41 LK 67 in Live Oak County, south Texas. The site is situated in shallow colluvial deposits capping an old terrace remnant of the Frio River. The excavations involved 193 sq m in three separate areas and revealed in situ Late Prehistoric and Late Archaic components. Recognizably older artifacts (including patinated chert flakes) from the surface and from excavations may represent older disturbed components or artifacts collected prehistorically from nearby sites. Radiocarbon dates, with medians ranging from 1590 to 660 B.C. (MASCA correction) are available only from the Lake Archaic component.

5G. Linguistics

PB82-260209 PC **A03**/MF **A01**
Academy for Educational Development, Inc., Washington, DC.
Reading by Radio: A Position Paper on the Use of Radio in Teaching Reading Skills for Educational Development,
Maurice Imhoof. Feb 81, 37p AID-PN-AAJ-433
Contract AID/DSPE-C-0051

This paper discusses the importance of language skills for developing country educational development and the usefulness and appropriateness of radio in advancing these skills. As a tool in the general educational process, radio possesses several advantages; it is low in cost, has immediate appeal, combines easily with other instructional modes, and is suitable for nonliterate audiences. These factors allow radio to improve educational quality and relevance, reduce educational costs, and improve access to education, especially in rural areas. Radio has been widely used for language instruction specifically and has proven especially helpful in upgrading the skills of unqualified teachers. After outlining the profound causal relationship between reading and the development of personal awareness of self and the world, as revealed in contemporary psycholinguistics, and the particular problems inherent in learning to read a second language, the author shows that radio is ideally suited for language instruction since it provides the opportunity to master new and different sounds, to repeat new grammatical devices in a variety of ways, and to practice new vocabulary in entertaining but extensive contexts. The use of radio for language instruction is particularly recommended in developing countries short on finances and long on language arts deficiencies.

5H. Man-Machine Relations

AD-A118 721/0 PC **A06**/MF **A01**
National Research Council, Washington, DC. Assembly of Behavioral and Social Sciences.
Vision Research for Flight Simulation.
Final rept.,
Whitman Richards, and Key Dismukes. Jul 82, 108p AFHRL-TR-82-6
Contract F33615-80-C-0009

This report is based on a workshop organized by the Committee on Vision of the National Research Council and by the Operations Training Division of the Air Force Human Resources Laboratory at Williams AFB in June 1980. The workshop brought together vision scientists from academia and government scientists concerned with research on visual displays for flight simulation. The principal objective was to provide recommendations concerning fruitful approaches for the conduct of research on what visual information is needed for simulation and how it might best be presented. Low-level flight was used as a focus for discussion of problem-solving approaches. The technical report prepared by the steering group provides examples of particular research strategies that might help elucidate several of the long-range issues in visual simulation.

N82-29900/9 PC **A02**/MF **A01**
Air Force Flight Test Center, Edwards AFB, CA.
Quantification of Pilot Workload Via Instrument Scan.
J. R. Tole, A. T. Stephens, R. L. Harris, and A. Ephrath. 21 Jan 82, 17p NASA-CR-169238, NAS 1.26:169238
Contracts NCC1-23, NCC1-56
Presented at and Aiaa Workshop on Flight Testing to Identify Pilot Workload and Pilot Dyn., Edward AFB, Calif., 19-21 Jan. 1982.

The use of visual scanning behavior as an indicator of pilot workload is described. The relationship between level of performance on a constant piloting task under simulated IFR conditions, the skill of the pilot the level of mental workload induced by an additional verbal task imposed on the basic control task, and visual scanning behavior is investigated. An increase in fixation dwell times, especially on the primary instrument with increased mental loading is indicated. Skilled subjects 'stared' less under increased loading than did novice pilots. Sequences of instrument fixations were also examined. The percentage occurrence of the subject's most used sequences decreased with increased task difficulty for novice subjects but not for highly skilled subjects. Entropy rate (bits/sec) of the sequence of fixations was also used to quantify the scan pattern. It consistently decreased for most subjects as the four loading levels used increased.

5I. Personnel Selection, Training, and Evaluation

AD-A118 447/2 PC **A02**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Computerized Adaptive Testing Project: Objectives and Requirements.
Technical note,
James R. McBride. Jul 82, 14p Rept no. NPRDC-TN-82-22

As lead laboratory in a joint-service project, NAVPERSRANDCEN is contracting for design, development, testing, and evaluation of a system for automated adaptive administration of military personnel selection tests. This report describes the planned contracting approach and system requirements for developing a computerized adaptive testing system (CAT). (Author)

AD-A118 484/5 PC **A03**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Validation of Naval Academy Selection Procedures for Female Midshipmen.
Final rept. FY 80-81,
Idell Neumann, and Norman M. Abrahams. Jul 82, 26p Rept no. NPRDC-TR-82-54

Current U.S. Naval Academy selection procedures were developed for the exclusively male population that existed there before July 1976. This research was initiated to assess the appropriateness of these procedures for female midshipmen and to revise the procedures if the system was found ineffective. Male and female midshipmen in the classes of 1980 through 1983 were compared to determine whether differences existed in mean predictor and performance scores and to assess the validity of predictors.

AD-A118 500/8 PC **A05**/MF **A01**
Courseware, Inc., San Diego, CA.
Instructional Systems Development for P-3 Aircrew Training.
Final rept. Jan 75-Jun 80,
Kathleen T. Long, Carol Freedman, Richard A. Walker, and Walter F. Thode. Jul 82, 93p NPRDC-TR-82-51
Contract N00123-77-C-0792
See also Rept. nos. NPRDC-SR-82-18, AD-A113 491 and NPRDC-SR-82-13.

A new instructional system was developed for the 14 aircrew training tracks of the P-3 Fleet Readiness Squadron (FRS) training system. An instructional systems development (ISD) model was used to describe training requirements, to develop instructional materials, and to satisfy implementation and management requirements. This program arose because of the requirement that P-3 aircrew training be conducted in the face of restrictions in training resources, and the need to standardize training being provided by the two P-3 FRSs. Recommendations are provided concerning the development and implementation of large-scale training program using ISD methodology. (Author)

AD-A118 504/0 PC **A13**/MF **A01**
Vreuls Research Corp., Thousand Oaks, CA.
Team Training through Communications Control.
Final rept. 4 Aug 80-4 Nov 81,
Wilmon Crowe, Mary Hicklin, Michael Kelly, Richard Obermayer, and William Satzer. Feb 82, 287p
NAVTRAEQUIPC-80-C-0095-1
Contract N61339-80-C-0095
Prepared in cooperation with Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.

This report documents the results of an analysis of the team training problem in an anti-submarine warfare context. Based on this analysis, a system concept for a Team Training Through Communications Control Training/Research Demonstration System is presented. System functional requirements are described, and a staged implementation plan is recommended. (Author)

AD-A118 558/6 PC **A06**/MF **A01**
Technion - Israel Inst. of Tech., Haifa. Center of Human Engineering and Industrial Safey Research.
Improving Time-Sharing Performance by Enhancing Voluntary Control on Processing Resources.
Interim rept. 1 Oct 79-30 Sep 80,
Michael Brickner, and Daniel Gopher. Feb 81, 114p
HEIS-81-3, AFOSR-TR-82-0633
Grant AFOSR-77-3131

Development of voluntary control on processing resources in concurrent task performance is studied within a training paradigm which attempts to identify the components of time-sharing skills. Two experiments are described in which subjects were trained under dual task conditions. In the first experiment three groups of subjects were trained in the concurrent performance of pursuit tracking and letter typing. One group practiced under 5 different levels of inter-task priorities with augmented on-line feedback on performance. Another group received feedback augmentation but practiced only under equal priorities conditions. A third group was allowed to develop its spontaneous strategy with no feedback augmentation or priority manipulation. In the second experiment only the first two groups were contrasted in the joint performance of letter typing and digit classification. Experimental results demonstrated that training under variable priority conditions may lead to improved performance capabilities on several aspects of the time-sharing situation. These results are interpreted to indicate that human operators can actively control their resource allocation but appear to have limited knowledge or skill to ensure the efficiency of their allocations.

AD-A118 559/4 PC **A02**/MF **A01**
Technion - Israel Inst. of Tech., Haifa. Center of Human Engineering and Industrial Safey Research.
On the Training of Time Sharing Skills: An Attention Viewpoint.
Interim rept. for period ending Dec 80,
Daniel Gopher. Jan 81, 7p HEIS-81-2, AFOSR-TR-82-0632
Grant AFOSR-77-3131

Training of time-sharing skills is discussed within an attention framework in which poor time-sharing performance is interpreted to stem from scarcity or inefficient utilization of processing resources. Practice is argued to increase resource availability either by re-

ducing the resource demands of each task, improving coordination, or enhancing the voluntary control on resource allocation. Based on this analysis notions of skill generalizations and implications for the development of training procedures are examined. (Author)

AD-A118 717/8 PC **A03**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Surface Warfare Junior Officer Retention: Early Career Development Factors.
Technical rept. Aug 81-Mar 82,
Thomas M. Cook, and Robert F. Morrison. Aug 82, 33p Rept no. NPRDC-TR-82-59

This investigation, the third in a series based on data collected from a sample of junior surface warface officers (SWOs) during 1978-79, addressed factors that affect their early career/professional development and the relationships between developmental progress, officer performance, and career intent. Results indicated that timely completion of career essential qualifications was not related to background factors such as commissioning source, academic class rank, or military class rank, but it was related to attendance at the Surface Warfare Officer School (SWOS)-Basic, shipboard assignment variation, and individual perceptions of the work environment during the initial sea tour. Also, professional development progress was positively related to career intent and officer performance, as indicated by fitness reports. Findings are discussed with attention to policy/leadership implications.

AD-A118 719/4 PC **A07**/MF **A01**
Army Concepts Analysis Agency, Bethesda, MD.
Selective Reenlistment Bonus (SRB) Study.
Final rept.,
Harlan J. Lenius, Ola C. Berry, Joel Levy, and Joseph P. Seletsky. Aug 82, 136p Rept no. CAA-SR-82-6

The SRB Study determined the historical effect that SRBs have had on reenlistment rates through a multiple stepwise regression analysis of data from Jan 76 through Jun 81. Data analyzed for each MOS/zone consisted of reenlistment rates, migration rates, SRB multipliers assigned, unemployment rates, military/civilian pay ratio and the Consumer Price Index. The SRB regression coefficient resulting from the analysis represented th enet change in a reenlistment rate for an MOS/zone brought about by a change in the SRB multiplier. The SRB regression coefficients were applied to current reenlistment rates, adjusted for migration, to estimate the reenlistment rates that could be achieved at each multiplier level. these estimated reenlistment rates by multiplier for each MOS/zone were used in the SRB allocation methodology developed. Selection criteria to determine which MOS/zones were most critical to receive an SRB were identified, data ranges and value weights were assigned to each critierion, and an importance factor was developed for each criterion. Criticality weights for each MOS/zone were then computer using a weighting technique. These criticality weights were also used in the SRB allocation methodology developed.

AD-A118 750/9 PC **A04**/MF **A01**
Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.
Prototype Configuration Report for Air Intercept Controller Prototype Training System.
Final rept. 28 Sep 78-11 Feb 80,
Ronald D. Granberry, Robin Halley, and Michael R. King. Jul 82, 57p 8641-A00C, NAVTRAEQUIPC-78-C-0182-6
Contract N61339-78-C-0182

This report delineates the design criteria and human engineering principles and practices to be applied in the design and general arrangements of the ACE Prototype Training System. The specifics for site preparation, detailed floor plans and environmental requirements will be developed in the Prototype Facilities Report to follow. (Author)

AD-A118 760/8 PC **A02**/MF **A01**
Training Analysis and Evaluation Group (Navy), Orlando, FL.
Use of the ASVAB for Assignment of Gates-MacGinitie Reading Test Levels.
Technical memo.,
Cheryl J. Brown, and J. Peter Kincaid. Jul 82, 19p Rept no. TAEG-TM-82-4

Entering recruits, tested at the Recruit Training Command, Orlando, received either Level D, E, or F of the Gates-MacGinitie Reading Tests which are designed to test individuals with increasingly higher levels of reading proficiency. The purpose of the testing was to relate the recruits' reading ability levels to their Armed Services Vocational Aptitude Battery (ASVAB) scores from the two verbal subtests Word Knowledge and Paragraph Comprehension so that ASVAB (WK+PC) cutoff scores could be derived for assigning a recruit the Gates-MacGinitie test of the appropriate difficulty level. This report suggests that administering level D of the Gates-MacGinitie tests to all recruits does not provide an accurate classificatory scheme. Using three levels of the test will provide accurate reading grade levels for all recruits and will make the Gates-MacGinitie an appropriate screening device for remediation programs at all stages of Navy training. (Author)

AD-A118 769/9 PC **A03**/MF **A01**
Courseware, Inc., San Diego, CA.
Establishing Relative Costs in a Complex Training System: A Cost Assessment Model and Its Application in the P-3 Fleet Readiness Squadron Aircrew Training System.
Final rept. Jan 75-Jun 80,
Walter F. Thode, and Richard A. Walker. Aug 82, 47p NPRDC-SR-82-32
Contract N00123-77-C-0792

Training system decisions are often made without a complete understanding of the impact on system costs. This report describes a model that can be used to estimate and compare the costs of training system components and of potential changes to the components. The model is intended for use by managers of complex training systems who are contemplating changes. The cost assessment model is presented, and is then applied to data available from the P-3 fleet readiness squadron (FRS) aircrew training system. (Author)

AD-A118 785/5 PC **A03**/MF **A01**
Minnesota Univ., Minneapolis. Center for Interest Measurement Research.
Development and Evaluation of Strong-Campbell Interest Inventory Scales to Measure Interests of Military Occupational Specialties of the Marine Corps.
Final rept. Jul 78-Sep 80,
Jo-Ida C. Hansen. Aug 82, 50p NPRDC-TR-82-60
Contract N66001-78-C-0198

The purpose of this investigation was to develop and evaluate scales, using the item pool of the Strong-Campbell Interest Inventory (SCII) to measure interests of 12 specified MOSs. The empirical method of contrast groups was used for scale development using 4 different reference samples and 11 MOS criterion samples; these comparisons extracted sufficient items for 39 scales. Reliability and validity of each scale were assessed in three phases. Results indicated that useful scales could be developed for most of the MOSs (except infantry and artillery) if sufficient samples could be obtained. It was recommended that an attempt be made to collect larger samples for those scales developed with small sample sizes. (Author)

AD-A118 786/3 PC **A04**/MF **A01**
Washington Headquarters Services (DOD), DC. Directorate for Information Operations and Reports.
Department of Defense Military Manpower Statistics.
May 82, 57p

MILITARY MANPOWER STATISTICS (MMS) is a monthly publication prepared by the Washington Headquarters Services, Directorate for Information Operations and Reports (WHS/DIOR) of the Office of the Secretary of Defense. The MMS report presents audited statistical data pertaining to military personnel on active duty and personnel in military reserve components, for the current fiscal year on a monthly basis. The March, June, September, and December issues contain quarterly summaries of certain military manpower data as annotated in the Table of Contents. Although these tables are revised quarterly, they are published without changes in two subsequent monthly editions of this publication. The publication is generated from a computerized data base developed and maintained by the Manpower Management Information Division of WHS/DIOR.

AD-A118 787/1 PC **A04**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Men and Women in Ships: Preconceptions of the Crews.
Preintegration rept. no. 4, Feb 79-Jul 80,
Carol S. Greebler, Patricia J. Thomas, and Judy D. Kuczynski. Aug 82, 58p Rept no. NPRDC-TR-82-57

Preintegration attitudes and expectations of 1936 men and 346 women assigned to six Navy ships were measured before the women reported aboard. Results showed that the majority of men believed integration would improve crew morale, but would impact negatively on discipline and increase interpersonal conflict. Lower ranking men favored integration, although they held the most traditional attitudes toward the roles of women and expected women would receive preferential treatment in job assignments, physically demanding work, and disciplinary action. Men working in departments where women are rarely found held traditional attitudes toward women's roles and were pessimistic about integration. The women were most concerned with profanity, proving themselves, and resentment from men. (Author)

AD-A118 803/6 PC **A06**/MF **A01**
Naval Aerospace Medical Research Lab., Pensacola, FL.
Multiplex Controller Aptitude Test and Occupational Knowledge Test: Selection Tools for Air Traffic Controllers.
Special rept.,
Michael G. Lilienthal, and Frank S. Pettyjohn. 15 Dec 81, 116p Rept no. NAMRL-SR-82-1
Contract DTFA01-80-Y-30528

The cost of training Air Traffic Control (ATC) personnel has risen rapidly. Attrition of students prior to completion of the training results in loss of invested funds as well as a delay in providing a fully qualified ATC specialist to the field for both military and civilian agencies. Improved selection and prediction tests for ATC personnel have been recognized as essential to decrease attrition rates. This study examined the selection utility of the Federal Aviation Administration (FAA) prototype ATC test battery. The test protocol consisted of the Multiplex Controller Aptitude Test (MCAT), a job simulation test; and the Occupational Knowledge Test (OKT), a job knowledge specific test. Two-thousand four-hundred ninety-nine FAA/ATC Academy trainees from the 1978 through 1980 period had taken two versions of the Multiplex Controller Aptitude Test (MCAT1) and MCAT2) and one version of the Occupational Knowledge Test (OKT). Test score s for 1,954 of these subjects were merged with information concerning their sex, education, ATC experience, ATC option, and pass/fail status at the ATC Academy. Item analyses indicated the MCAT contained very difficult or very easy items in over 50 percent of the test questions. The OKT had acceptable levels of item difficulty at the 25 percent level.

AD-A118 829/1 PC **A03**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Secondary Mathematics Education in the Soviet Union, an Individual Study Project.
Study project,
James S. Armstrong. 14 May 82, 39p

The aim of this paper is to acquaint mathematics educators and teachers with the current status and trends in Soviet mathematical education at the secondary level in light of recent claims by several prominent American educators that the superior quality of the Soviet program represents a potentially serious threat to the national security of the United States. Covered are educational philosophy and pedagogy, teacher education, and testing procedures. Special emphasis is devoted to the mathematics curriculum in the Soviet 10-year, General Education School. The investigation identifies certain specific Soviet practices in the areas of curriculum development and teacher education that warrant close study and consideration by U.S. educators. However, the study concludes that the strength of the Soviet educational threat to our national security derives more from the sense of Soviet national dedication and unity of purpose than from any particular unique characteristic of the educational system itself, and that the Soviet challenge can be met successfully by establishing a national resolve to do so.

AD-A118 831/7 PC **A03**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Killers, Fillers and Fodder.
Study project,
Thomas A. Horner. 2 Jun 82, 27p

The current U.S. tank force is badly outnumbered by our potential adversary, the Soviet Union. We have not been able to offset this disadvantage by buying more tanks, or by improving our training or the quality of our tanks. The human factor has not been adequately considered, however, and perhaps it alone can provide us with a decisive advantage over our enemy. Currently, only a small percentage of our tank commanders would be truely effective in combat. We must select tank commanders who are intelligent enough to employ their weapon system to full advantage. The Army should: raise the Armed Forces Qualification Test (AFQT) score standard fo. all tank commanders to Category II. All tankers should be required to possess good agility, hand-eye coordination, manual dexterity, have excellent vision and not wear glasses. Tests should be developed to predict combat effectiveness and only men who show a strong potential to be battlefield killers should be selected as tank commanders. Finally, the Army should consider replacing enlisted tank commanders with armor warrant officers who meet the high standards described above.

AD-A118 833/3 PC **A04**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Effectiveness of the Battalion Personnel Administration Center, A Group Study.
Study project,
Frederic D. Bangasser, Ronald E. Brooks, and Gerald I. Stanley. 25 May 82, 69p

Since the implementation of the Personnel Administration Center (PAC) concept at battalion level in 1976, there has been considerable debate with regard to its effectiveness and its impact on battalion units. Several Army major commands have conducted studies concerning PAC effectiveness, but no major revisions of the system have resulted. Nevertheless, the debate on the PAC performance continues. This study reviews previous PAC studies and gives an extensive analysis of current data collected by survey of 374 respondents and interviews of 189 key personnel involved in the PAC system at battalion and company level. The study sample included 141 current or former commanders of PAC-supported battalions. The paper concludes that significant administrative workload still exists at company level even though the PAC has shifted much of that workload to battalion, and that the PAC has not freed company commanders and first sergeants to participate in training to the extent envisioned at implementation. The study also found that the number of people working on personnel and administrative tasks within the battalion has increased and that nearly all company-size units have shadow clerks. Fin ally, it concludes that the PAC, notwithstanding its shortcomings, is a viable concept. It recommends that the PAC concept be retained and that a clerk be authorized at company level to correct its most significant weakness. (Author)

AD-A118 846/5 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Opportunities Exist to Reduce Operating Costs of the Department of Defense Overseas Dependents Schools.
26 Aug 82, 28p Rept no. GAO/HRD-82-86
Report to the Secretary of Defense.

This report discusses opportunities for savings in the personnel and pupil transportation programs in the Department of Defense overseas dependents schools.

AD-A118 850/7 PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Army's Initiatives to Improve the Skill Qualification Test Program May Not Achieve Promised Changes.
18 Aug 82, 7p Rept no. GAO/FPCD-82-28
Report to the Secretary of the Army.

No abstract available.

AD-A118 851/5 PC **A06**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
What is a Quality Soldier.
Study project,
Ralph W. Bilberry, Meredith H. Caram, John S. Luallin, and Richard S. Mason. 13 May 82, 111p

The purpose of this study was to investigate and determine What is a Quality Soldier. The study includes an extensive review of the literature and a field survey. The review of the literature shows that the Army recruiting policy emphasis on high school graduates and Mental Category I-IIIA is based on statistical data. Enlistees meeting the high school graduate and Mental Category I-IIIA requirement tend to be more motivated toward completion of initial enlistment, have fewer discipline problems, and are less alienated in sociopolitical sense than non-grads and those with lower mental category AFQT scores. In the field survey a convenience sample of 1829 soldiers from line units, training units, and recruiters was conducted to obtain their perceptions of quality as related to intelligence, motivation, attitude, discipline and technical competence. The major conclusions of the survey were that motivation, positive attitude, and self-discipline are the most desired qualities in a soldier.

AD-A118 853/1 PC **A06**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Optimal Length of Assignment of PPBES Programmers of the DA Staff.
Study project,
Paul T. Weyrauch. Jun 82, 117p

The purpose of the study was to determine the optimal tour length for officers assigned to the DA staff as programmers in the DOD Planning, Programming, Budgeting, and the Execution System (PPBES). Given the complexity and dynamics of the PPBES, the effort was to determine how long officers remained assigned to programming billets and reasons for their reassignment, to determine how long officers should be assigned to programming billets, and to determine whether or not attainment of that optimal tour length should take priority over assignment to key positions such as 05/06 level command or attendance at senior service colleges. Data on which to base the study were generated by questionnaires sent to 197 past and present programmers; 164 useable responses were received. An analysis of the data revealed the uniqueness of the programmer's job and the requirements to stabilize PPBES programmer's tours for 24-30 months and to only assign specially screened and motivated officers who have 12-18 months experience as action officers on the DA staff. (Author)

DE82008348 MF **A01**
RAND Corp., Santa Monica, CA.
Intermediate Level Skills Training Program. Cost Estimating, Unit 3.
Feb 82, 115p DOE/MA-0028-Sup.
Contract AC01-79PE70078
Portions of document are illegible.
Available in microfiche only.

This study seeks a better understanding of the reasons for inaccurate estimates of capital costs and performance difficulties for first-of-a-kind process plants, especially energy process plants. The questions examined were: what factors are responsible for inaccurate cost estimates for process plants; how well do pioneer plants perform and what factors are responsible for poor plant performance; and what are the implications of the answers to the above questions for planning by the process industries and the Department of Energy; 34 firms in the process industries provided data to support a statistical analysis of cost estimation error and performance shortfalls in pioneer plants. The principal conclusions were: both performance problems and cost-estimation error were common among the plants examined, are associated with characteristics of the project or technology; and unanticipated inflation, unanticipated regulatory changes, scope changes, and other external factors such as bad weather and strikes, are not the principal causes of cost underestimation. The degree of novelty of the plants technology contributes the variation found in both the cost-estimation error and performance estimate; the performance analysis suggests that the routinely high performance assumed for pioneer process plants when financial analyses are done is unrealistic, i.e., over 50% of the plants in the sample failed to achieve their production goals in the second six months after start-up. It is expected that this analysis and its results will provide industry and government with means for improving the assessment of the commercial prospects of developing technologies. (ERA citation 07:043795)

DE82011694 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Directorate of Administration.
Comparison of Compensation Paid Scientists and Engineers in Research and Development: DOE National Survey of Compensation, 1981 Data.
Jan 82, 33p DOE/MA-0067
Portions of document are illegible.
Microfiche only after original copies are exhausted.

Under a contract with the US Department of Energy, the Columbus Laboratories of Battelle conducts an annual salary survey entitled A National Survey of Compensation Paid to Scientists and Engineers Engaged in Research and Development Activities. The 1981 report contained the results of its 14th annual survey and included data for five types of R and D establishments (sectors): Industry, Nonprofit Research Institutes, Federally Funded R and D Centers (referred to as Contract Research Centers), Federal Government Laboratories, and Educational Institutions. This study covers 18 DOE contractor-operated laboratories, 7 of which are included in the Contract Research Center sector of Battelle's National Survey. Each DOE Laboratory agreed that computer tapes of its submission, reflecting Survey input, would be made available to DOE for this study. The purpose of this study is to compare compensation and other characteristics of the DOE Laboratories with National Survey patterns.

ED-200 245 Not available NTIS
Capitol Region Education Council, West Hartford, CT.
1980 Multi-Media Evaluation Report,
Lois J. Nystrom. 1980, 252p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210. Also available from METRO/Capital Region Education Council, 212 King Philip Dr., West Hartford, CT 06117 ($25.00).

Over a 12-month period, urban, suburban, and rural (non-farm) educational programs in Connecticut were evaluated to determine the quality of instructional materials in those programs. Evaluation data were collected from statistical summaries, predictive instruments, teacher reactions, student reactions, in-depth studies, evaluation seminars, and observations. Materials covered in the report are divided into two categories: 16mm films (363 titles) and building level materials (145 items), including filmstrips, kits, records, cassettes, study prints, slides, models, and overhead transparencies from 42 commercial distributors. Evaluative data for all types of media are presented in the form of composite sheets which draw together, average, and/or enumerate information collected from users of the materials. Representative teacher comments and samplings of student comments are included. In addition, recommendations for the use of the report, guidelines and procedures for preparation of data sheets, and indicators to quality of products are given.

ED-200 249 Not available NTIS
South Carolina State Dept. of Education, Columbia.
Development, Operation and Maintenance of a Coordinated Communications Network.
Final rept.,
Al Evans. Oct 80, 202p
Contract NIE-75-0023
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

This final report of a 5-year dissemination capacity building program traces its development from the conceptual stage through the current stage of institutionalization of dissemination within the state department of education, reviewing major program components as well as the organization and administration of the program. A major aspect addressed is the revitalization and expansion of the linkage concept during the capacity building period. The conclusion addresses the impact of the program on a broad range of user audiences and on the improvement of educational practice in South Carolina, including results and benefits. Appendices include the organization of the Education Products Center, workshop evaluation checklists, statements of agreement, SHARE collection and distribution guidelines and forms, a guidebook for developing publications and audiovisual materials, user statis-

tics on technical assistance, and resource bulletins. Eight references are cited.

ED-201 299 Not available NTIS
Computer-Based Instruction and Cognitive Styles: Do They Make a Difference,
Michael J. Cosky. Oct 80, 19p
Paper presented at the National Conference on Computer-Based Education, Bloomington, MN, October 23-25, 1980.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA 22210.

Cognitive style is a potentially rich, but typically overlooked, source of individualization in computer based instruction (CBI). Using information about learners' cognitive styles in the design, development, and evaluation phases of CBI production can maximize individualization. In the design phase, for example, learners' cognitive styles can be assessed, using existing devices, and preliminary decisions can be made about what cognitive styles might be particularly important to the learner in accomplishing the learning objectives. Also in the design phase, the distribution of cognitive styles in the target population can be determined as a basis for decisions about the nature, grouping, and sequencing of instructional subtasks. In the development phase, cognitive styles can be matched with instructional strategies and activities, instructional media, and assessment tools. Finally, in the evaluation phase, a determination can be made about the extent to which the earlier matches between learning task demands and learners' cognitive styles, which were specified in the design and development phases, were appropriate.

N82-30121/9 PC **A02**/MF **A01**
Howard Univ., Washington, DC. School of Engineering.
Prefreshman and Cooperative Education Program.
1976, 5p NASA-CR-170423, NAS 1.26:170423
Sponsored by NASA.

Of the 93 students enrolled in the PREFACE program over its four-year history, 70 are still in engineering school. Tables show profiles of student placement and participation from 1973 to 1977 (first semester completed). During the 1977 summer, 10 students were placed at NASA Goddard, 8 at DOE-Brookhaven, and 2 at American Can. Eleven students with less high school math preparation remained on campus for formal precalculus classes. Majors of the students in the program include civil, chemical, electrical, and mechanical engineering. Student satisfaction with their training experiences is summarized.

PB82-252172 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Human Resources Div.
Students Receiving Federal Aid Are Not Making Satisfactory Academic Progress: Tougher Standards Are Needed.
3 Dec 81, 55p HRD-82-15

The Federal Government provides billions of dollars in student aid each year under programs administered by the Department of Education, the Veterans Administration, and the Social Security Administration. These agencies have widely varying policies regarding satisfactory academic progress of students receiving assistance. In reviewing the academic progress standards applied to students at 20 institutions of higher education, GAO found that these standards were often inadequate and not always enforced.

PB82-253402 PC **A04**/MF **A01**
Bureau of Health Professions, Hyattsville, MD. Div. of Health Professions Analysis.
National Sample Survey of Registered Nurses II: November 1980,
Evelyn B. Moses, and William E. Spencer. Nov 80, 52p HRA/DF-82/002A
For system on magnetic tape, see PB82-253410.

The report is the summary of data collected in the second national sample survey of registered nurses. Questionnaires were mailed to about 40,000 individuals with current licenses to practice as registered nurses in the fall of 1980. The number of respondents totaled 30,642 or 79 percent of those surveyed. Responses to the survey were weighted to reflect the universe of registered nurses. The estimated number of registered nurses with current licenses to practice located in the United States in November 1980 was 1,662,382. Of these, an estimated 1,272,851 RN's were employed in nursing, 76 percent of the total RN's. The study also provides data on the demographic characteristics of the nurse population, their educational background, type of nursing employment and the functions performed, their hours of work and earnings, their activities if not employed in nursing and their geographic location.

PB82-253410 CP **T02**
Bureau of Health Professions, Hyattsville, MD. Div. of Health Professions Analysis.
National Sample Survey of Registered Nurses II: November 1980 Tape.
Data file,
Evelyn B. Moses, and William E. Spencer. Nov 80, mag tape HRA/DF-82/002
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-253402.

The report is the summary tape of data collected in the second national sample survey of registered nurses. Questionnaires were mailed to about 40,000 individuals with current licenses to practice as registered nurses in the fall of 1980. The number of respondents totaled 30,642 or 79 percent of those surveyed. Responses to the survey were weighted to reflect the universe of registered nurses. The estimated number of registered nurses with current licenses to practice located in the United States in November 1980 was 1,662,382. Of these, an estimated 1,272,851 RN's were employed in nursing, 76 percent of the total RN's. The study also provides data on the demographic characteristics of the nurse population, their educational background, type of nursing employment and the functions performed, their hours of work and earnings, their activities if not employed in nursing and their geographic location.

PB82-255720 PC **A11**/MF **A01**
National Commission for Employment Policy, Washington, DC.
National Commission for Employment Policy Seventh Annual Report: The Federal Interest in Employment and Training.
Annual rept.
Oct 81, 243p NCEP/ET/PR-81/03, PR-13
See also 6th annual report, PB81-209280.

The Commission selected this theme as the first of several forthcoming evaluations of issues that the Administration and the Congress will want to address as they consider the next stage in the evolution of national employment and training policy that must be faced because of the possible expiration of the Comprehensive Employment and Training Act in September 1982. The report contains the Commission's findings and recommendations together with the staff's report which summarizes the available knowledge of how past employment and training policies and programs have operated together with two specially prepared studies on troubled and displaced workers.

PB82-258666 PC **A11**/MF **A01**
Creative Associates, Washington, DC.
AID Assistance to Education: A Retrospective Study,
Francis J. Method, and Saundria Kay Shaw. Feb 81, 234p AID-PN-AAJ-460
Contract AID/DSPE-C-0075

The report is an analysis of the character, magnitude, and distribution of AID's education programming over the past 20 years, with emphasis on the period after 1970. The purpose is to inform AID decision makers and to strengthen the agency's ability to respond accurately to inquiries from Congress, researchers, and other interested parties. This study presents a significantly different picture of AID's education assistance from that of previous agency studies, which were drawn only from official accounting and classification systems. The study, using a classification system especially developed for this project, defines educational activities broadly to include support for education, training, and human resources development in all sectors. For example, agricultural universities and American Schools Abroad are included, although neither category is in the agency's education sector. The study also covers support provided through accounts for local currency, security/supporting assistance, development loans, and other special appropriations.

PB82-259029 PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Federal Personnel and Compensation Div.
Uniform Guidelines on Employee Selection Procedures Should Be Reviewed and Revised.
30 Jul 82, 44p GAO/FPCD-82-26, B-205215

The Uniform Guidelines on Employee Selection Procedures were adopted in 1978 by the Equal Employment Opportunity Commission, the Office of Personnel Management, the Departments of Justice and Labor, and the Department of the Treasury's Office of Revenue Sharing. The Guidelines were designed to assist employers, labor organizations, employment agencies, and licensing and certification boards to comply with Federal equal employment opportunity (EEO) laws. They were also to provide a framework for determining the proper use of tests and other selection procedures. The importance of the Guidelines to EEO enforcement is not, in GAO's opinion, at issue. GAO believes the Guidelines can have a major role in insuring compliance with EEO laws. However, there are problems with the Guidelines' technical and policy provisions and with their overall clarity. GAO believes the Guidelines should be reviewed and revised.

PB82-259391 PC **A08**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Paraprofessionals in Rural Development,
Milton J. Esman, Royal Colle, Norman Uphoff, and Ellen Taylor. 1980, 159p PP-1, AID-PN-AAJ-637
Contract AID/ta-BMA-8

The reluctance of developing country professionals to work in remote rural areas and the prohibitive cost of delivering the social services so sorely needed there attests to the need for effective paraprofessionals (PP's) as agents of rural development. This report, based upon a study of PP programs in six nations, describes the role of PP's in rural development, as well as the factors which spell success or failure for development efforts employing such personnel.

PB82-259680 PC **A02**/MF **A01**
Economic Research Service, Washington, DC. Economic Development Div.
Farm Labor Wage Issues.
Staff rept.,
Susan L. Pollack, Robert Coltrane, and William R. Jackson, Jr. Jun 82, 25p AGES-820615

Proposed immigration reforms would make the hiring of undocumented workers illegal. It would also establish a worker program to permit agricultural employers to bring legal foreign workers into the United States to replace illegal workers, but only when domestic workers are unavailable for farmwork. The proposed worker program would be a revision of the current H-2 temporary foreign worker program operated by the Departments of Labor and Justice. The procedures adopted for establishing wage rates and non-wage benefits of temporary foreign agricultural workers could significantly affect farm labor expenditures and the willingness of U.S. farmers to participate in the program. This analysis of 1980 H-2 adverse effect wage rates provides new information which policy-makers may use when they consider changes in current H-2 wage determination procedures.

PB82-260472 PC **A05**/MF **A01**
Bureau of Health Education, Atlanta, GA.
Health Education and the Black Community. Report of a Meeting Held at the Bureau of Health Education, Center for Disease Control, Atlanta, Georgia on July 26-27, 1979.
Dec 80, 80p HHS/CDC/CHPE-82-0116
Errata sheet inserted.

A conference on Health Education and the Black Community was held at the Bureau of Health Education. During the conference position papers were offered on the relevance of health education theories and their application to the black community, the impact of health education on black communities without changes in the external environment, the role of the health education process in improving the health status and quality of life in the black community, methodological and substantive issues in health education programming, school health education in black communities, health promotion among black populations,

perspectives on health education and health promotion in the black belt, competencies needed by health education personnel engaged in service to black communities, a categorical approach to comprehensive health promotion and disease prevention aimed at management of hypertension, prerequisites for health education in the black community, and health career development. Appendices include a participant roster, a list of issue that participants considered to need attention, and the agenda to the conference.

PB82-260480 PC **A09**/MF **A01**
Olympus Research Centers, Salt Lake City, UT.
Job Search: A Review of the Literature.
Final rept.,
Stephen L. Mangum. 1 Feb 82, 178p DLMA-21-49-80-06-02
Grant DL-21-49-80-06

The labor exchange process involves the successful completion of two sub-processes -- job search and recruitment. This research reviews the theoretical, empirical, and commercial literature related to these processes, with particular attention paid to what lessons for the teaching of job search training emerge from the literature. Among the findings of this literature review are the following: (1) the realization that the commercial literature is extremely selective and not applicable to all job seekers; (2) that for job search to be successful it must be treated as a full time job and a variety of search methods employed; (3) that an important ingredient of successful search is the packaging and motivating of the individual and such factors can be taught; (4) the positive impact of the group search or club concept; and (5) the need to structure job search training efforts to the occupational, ethnic, and personal characteristics of the individual client.

PB82-260654 PC **A07**/MF **A01**
Olympus Research Centers, Salt Lake City, UT.
State of the Art in Job Search Training.
Interim rept. 1 Jan 80-30 Sep 81,
Miriam Johnson. 1 Feb 82, 143p DLMA-21-49-80-06-01
Grant DL-21-49-80-06

The research included 30 visits to sites selected for unique modeling dimensions and analysis of program materials from additional sites. The study found that: (1) Job Search Training is an important and valuable employability tool for different types of job seekers - relatively short term, low cost and effective. (2) Programs have suffered from persistent neglect from national policy makers and administrators. Hence, there is duplication of effort, underutilization, and inadequate national standards for measuring costs and outcomes. The study identified minimum needs, gaps, and unanswered questions. (3) Programs appear to be overinfluenced by the private sector white collar, professional orientation toward job search with inadequate attention to hiring processes and environments in other occupations and settings. (4) The content or substance of what is taught in many programs reflects the sparse labor market orientation of many major program designers. ORC recommended a series of corrective actions.

PB82-261066 PC **A07**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Women and Minorities in Science and Engineering.
Jan 82, 134p NSF-82-302
See also PB-264 673.

This report provides a factual picture of the current situation and recent trends in the participation of women and minorities in science and engineering (S/E) employment and training. It is comprised of three chapters: (1) Employment of Women and Minorities in Science and Engineering, (2) Labor Market Indicators, and (3) Education and Training, and includes 65 appendix tables. Where possible, minority data are broken out for Blacks, Asians, Hispanics, and American Indians. Information is included on S/E fields, types of employer, primary work activities, labor force participation rates, unemployment, salaries, earned degrees, graduate degree attainment rates, postdoctorates, precollege mathematics and science training, and other employment and education measures.

PB82-261074 PC **A03**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Science and Engineering Employment: 1970-80.
Special rept.
Mar 81, 28p NSF-81-310
See also PB80-209836.

The report is based on a new series of estimates of scientists and engineers employed in science and engineering (S/E) jobs. The estimates represent an effort by the National Science Foundation (NSF) to develop a historical series that accounts for both employment status and the nature of the employment activity, i.e., an S/E employment series. These estimates differ from employment information generally published by NSF in that they are not based on survey data. Appendix tables provide a detailed methodology of the estimates' generations as well as the employment tables. Highlights include: (1) employment in S/E jobs increased 32 percent from 1970 to 1980, growing substantially faster in the second than first half of the decase; (2) the distribution of the S/E work force has shifted from engineering into computer specialties; (3) the proportion of S/E employment in various sectors remained stable over the decade; and (4) employment of scientists and engineers primarily in R&D activities increased at rates similar to that for all scientists and engineers.

PB82-262098 PC **A07**/MF **A01**
National Educational Inst. for Economic Development, Washington, DC.
National Educational Institute for Economic Development: Final Report.
Mar 81, 141p EDA-82-0051
Grant EDA-99-06-07028

During the period September 1979 - September 30, 1980, the Institute provided training to ninety-five economic development practitioners at five training sessions. Four hundred and sixty-six participants attended seven seminars on business loan financing. The latter attendance records also reflect participation by speakers and NEIED staff.

PB82-262197 PC **A03**/MF **A01**
Puerto Rico Administration of Regulations and Permits, Santurce.
Sugerencias para Supervisores (Suggestions for Supervisors).
1979, 34p
Text in Spanish.

The performance of a government office and its image depend primarily on its personnel and their feelings. This booklet was written in order to provide all supervisors with the means to develop expertise in human relations.

PB82-262205 PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Non-Formal Education: A Remedy and a Restorer,
Oct 75, 47p SER-104

The 28th All India Adult Education Conference on Non-Formal Education was held in Jabalpur, Madhya pradesh, India from October 25-27, 1975. The conference discussed the subjects following: Non-formal education for school dropouts; Non-formal education for youth-age group 15-25; Non-formal education for women, Non-formal education for farmers, Non-formal education for industrial workers; and Policy for non-formal education and its financing. The seminar concluded that non-formal education was relevant for educating those of school age and those out of school with particular usefulness in improving the skills and productivity of urban workers, encouraging more intensive and fruitful participation of women in community activities, and programs of civic education. The seminar called on more universities to start non-formal education programs.

PB82-262361 PC **A04**/MF **A01**
Indian Adult Education Association, New Delhi.
Curriculum Construction for Non-Formal Education for the Age Group 15-25,
Satyen Maitra. Sep 76, 51p SER-110

This is the report of a seminar on youth non-formal education curriculum construction held at Narendrapur, India from September 16-22, 1976. The seminar working paper covered profiling the target group (rural or urban poor, women, tribals), definition and components of a curriculum, & its objectives, content, methods, and evaluation. The seminar recommended that a state board be set up for non-formal education and that it in turn should establish many polytechnics to fill the actual education needs of various communities. The board should also establish the programs to be taught based on the findings of community needs.

PB82-262379 PC **A04**/MF **A01**
Indian Adult Education Association, New Delhi.
Curriculum Construction for Non-Formal Education,
S. C. Dutta, Amrit Kaur, R. K. Singh, Rita Maitra, and Susheela Bhan. Oct 76, 55p SER-113

This is the report of a seminar on non-formal education curriculum construction held in Mysore, India from October 15-18, 1976. Subgroups discussed curriculum construction for women, for age group 6-14, for age group 15-25. All the groups agreed that the curriculum for their respective target groups should be flexible, diversified, need-based, and should link environment and deal with problems which have been identified through a survey of the area. The curriculum should have a multimedia approach and awareness, understanding, skill, and action must be integrated in the preparation of the content. Non-formal education should be considered as essential to integrated rural development. 10% of each state board of education's budget should be allocated to non-formal education.

PB82-262387 PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Curriculum Construction for Non-Formal Education of Women,
T. A. Koshy. Sep 76, 42p SER-109

This is the report of a seminar on non-formal education for women held at Sri Venkateswara University, Tirupati, Andhra Pradesh, India from September 5-9, 1976. The aim of the workshop was to lay down guidelines for curriculum construction and to prepare a draft curriculum by taking specific subject areas pertaining to women's non-formal education, both urban and rural. It concluded that all socio-economic schemes and programs for the benefit of women should have a built-in component of non-formal education. The curricula should be adapted to the local conditions and purpose. The draft curriculum should be pre-tested or at least discussed with participants before the teaching materials are prepared. Non-formal education teachers need a higher level of competence and understanding than normal teachers and should be compensated accordingly. Quick surveys will suffice for evaluation, and should not take longer than 6 weeks.

PB82-262452 PC **A04**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Foreign Participation in U.S. Science and Engineering Higher Education and Labor Markets.
Special rept. 1954-79.
Dec 81, 74p NSF-81-316

The report examines the effect of foreign student participation in U.S. higher education in the decade of the 1970s and the long-term impact of science and engineering (S/E) doctorate production and post-doctorate assignments of foreigners on the U.S. S/E labor market. Detailed statistical tables are included which point to the concentration of foreigners according to the disciplines studied, their countries of origin, their Ph. D. degrees earned, and postdoctoral employment. Among major findings of this study are: Over 40 percent of the 1979 graduate enrollment in engineering and over 30 percent of the enrollment in mathematical/computer sciences consisted of foreign students; one-half the engineering doctorates awarded in 1979 were received by foreign citizens; and foreigners constituted about one-third of the S/E doctorates employed in doctorate-granting institutions in 1979. Sources of statistics used in this study were the NSF Survey of Graduate Science Students and Postdoctorates and the Survey of Earned Doctorates; and data from the Institute of International Education and the National Center for Education Statistics, Department of Education.

PB82-262478 PC **A05**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Characteristics of Recent Science/Engineering Graduates: 1980.
Detailed statistical tables.
Mar 82, 97p NSF-82-313
See also PB81-188054.

The tables present data on the demographic and employment characteristics of the science and engineering graduates of the 1978 and 1979 classes.

PB82-262486 PC **A03**/MF **A01**
Conference Board of the Mathematical Sciences, Washington, DC.
Employment of Recent Bachelor's and Master's Graduates in the Mathematical and Computer Sciences.
Final rept. 1972-80,
Truman Botts. Jun 82, 41p NSF-SRS-81-05118
Grant NSF-SRS81-05118

In each of the years 1976, 1978, 1979, and 1980, NSF surveyed science and engineering graduates of the prior two years. This project examines the data from those respondents whose bachelor's or master's degrees were in mathematics, statistics, computer science or operations research or whose employment was in an occupation related to these fields or mathematics education.

PB82-262650 PC **A03**/MF **A01**
Indian Adult Education Association, New Delhi.
Non-Formal Education for School Dropouts and Youth.
1975, 46p SER-106

The workshop studied the reasons for school dropouts and the programs of non-formal education for the age group 6-14. The symposium studied the needs and programs of non-formal education for the youth.

PB82-263187 PC **A07**/MF **A01**
Educational Testing Service, Princeton, NJ.
Testing Literacy Levels in the WIN Population.
Final rept. Sep 80-Apr 82,
Marlene Goodison. 30 Apr 82, 148p DLETA-51-34-80-03
Contract DL-51-34-80-03

The report describes the job-readiness skills, in terms of literacy and numeracy of a representative national sample of WIN registrants. Skills were measured using the ETS Basic Skills Assessment Test. The performance of the WIN registrants was compared to the performance of the tests' national high school norming sample. The heterogeneity of the WIN populations' skills indicates the need for a variety of employment and training services beyond job search and placement for them to achieve self-sufficiency.

PB82-263195 PC **A08**/MF **A01**
Olympus Research Centers, Salt Lake City, UT.
Evaluation of JOB TRACK: A Youth Job Search Demonstration.
Interim rept. 1 Jan 80-30 Sep 81,
David C. Roberts. 1 Feb 82, 167p DLMA-21-49-80-06-3
Grant DL-21-49-80-06

JOB TRACK, as it operated in this period of the demonstration, was a two-day, non-stipended job search training program serving youth in San Francisco. The program is operated by the California Employment Development Department and the Mayor's Office of Employment and Training. The program demonstrated substantial impact as a result of the training: (1) Fifty percent of the participants found jobs in an average of 13 days compared to an expected average of 26 days; (2) At the last follow-up 12 weeks after the program, 66 percent of the participants had found jobs as compared to an expected rate of 49 percent. In the process of achieving its positive outcomes, the program produced marked changes in the participants' job search knowledge and job finding behavior. However, with no incentives to attract youth, the program experienced continuing problems of underutilization. The report presents findings about the youth search for work and documented that the youth transition from school to work was far more volatile than originally conceived.

PB82-263583 PC **A05**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Activities of Science and Engineering Faculty in Universities and 4-Year Colleges: 1978/79.
Final rept.
Dec 81, 83p NSF-81-323

The nature and extent of the academic science and engineering (S/E) enterprise is largely determined by the amount of time spent by S/E faculty in teaching, research, and related activities. This report provides the first national data on time spent by full-time faculty over an entire year in terms of time per week in: (1) Instruction, by classroom and other time; (2) research by source of support (Federal, non-Federal, and nonsponsored; (3) public service; (4) administration; (5) miscellaneous professional; (6) outside income producing activities, by consulting, publication, and other; and, (7) continuing education and professional enrichment. Activity data are reported by departmental field, by academic rank, by control and type of institution (doctorate-granting and nondoctorate-granting), and for doctorate and nondoctorate faculty. Data were collected from statistically represented samples of faculty in 20 fields of science and engineering during the 52 week period beginning November 1, 1978. A subsample of faculty was asked to report their time in each activity during a specified seven day period. The responses were weighted to represent all full-time S/E faculty in S/E degree-granting institutions.

PB82-263716 PC **A07**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Young and Senior Science and Engineering Faculty, 1980.
Special rept.
Jun 81, 144p NSF-81-319
See also PB-242 852.

This report continues the monitorship by the National Science Foundation of science and engineering (S/E) faculty who have held their doctorates for seven years or less. The 1980 survey expands the scope of earlier studies by inclusion of full-time, nonfaculty research doctorates and additional demographic detail. The report covers 19 major S/E fields and compares the characteristics and activities of recent S/E faculty with other full-time S/E faculty. Data are presented by field on research activities, including Federal support, and the opinions of department heads on the appropriateness of the division of research funds between young and senior faculty. Information is also presented on faculty tenure status, by age, sex, and race/ethnic group, and on faculty appointments and departures. The survey covered 1,866 doctorate-granting departments in 156 institutions that received at least $1.4 million in Federal funds for research and development in 1977. Seventy-nine percent of the departments responded. Returns were weighted to represent all eligible departments.

PB82-263740 PC **A09**/MF **A01**
National Science Foundation, Washington, DC. Div. of Science Resources Studies.
Academic Science: Graduate Enrollment and Support, Fall 1980 (Detailed Statistical Tables).
Surveys of science resources series.
Jan 82, 193p NSF-81-330
See also PB81-187411.

The report contains fall 1980 graduate enrollment data from the National Science Foundation's annual survey of the Nation's 633 institutions of higher education granting a doctoral and/or master's degree in a science or engineering (S/E) discipline. Data on graduate S/E students are tabulated by: (1) Enrollment status (full- or part-time); (2) level of study; (3) S/E discipline; (4) citizenship and racial/ethnic origin; (5) sex; (6) geographic distribution; (7) major sources and types of support; (8) control of institution (public/private); and, (9) institutions ranked by total graduate enrollment. Data on support, sex, and citizenship of postdoctorates are presented including trends. Trend tables are presented for most distributions. The methodology and response rate are described and a reproduction of the survey instrument is included.

PB82-263757 PC **A02**/MF **A01**
Bureau of Health Education, Atlanta, GA.
Primary Nursing: Can It Improve Patient Education.
1977, 11p HHS/CDC/CHPE-82-0105

Primary nursing is examined as a practice mode and as an organizational innovation that can foster patient education within inpatient units. Originating at the University of Minnesota Hospital in 1969, primary nursing is basically a return to the case method of assignment, with each nurse carrying a case load of four to eight patients. The nurse is responsible, over a 24-hour period, for collection of the nursing assessment data and preparation and maintenance of the plans for nursing care delivery and evaluation. The literature on primary nursing suggests that it increases nurse-physician and nurse-nurse communication and improves nurse-patient communication, as compared to team-teaching methods. Primary nursing also enhances comprehensiveness and continuity of services and ensures that nurses do more nursing than administrative work. The head nurse, when relieved of unit management responsibilities, helps th primary nurse meet both organizational and individual nurse-patient educational goals by providing the primary nurse with a clinical role model and resource person.

PB82-265521 PC **A05**/MF **A01**
Florida State Dept. of Education, Tallahassee.
Comprehensive Health Education Management Model.
Sep 80, 87p HHS/CDC/CHPE-82-0106

The Florida Comprehensive Health Education Management Model promotes a multifaceted approach to uniting State health and State education resources to improve comprehensive school health education in grades K-12. The model can help health education managers in other States utilize their official, professional, and voluntary health and educational resources to improve health education, and promote health education as an integral component of a State's health and education plans. The model is based on five major management functions that must operate at the State, regional, district, school, and classroom level, namely, advocacy, clearinghouse, coordination, evaluation, and innovation. Key aspects of the program are a permanent advisory and technical assistance structure at the State, regional, and local levels; instructional programs developed by local school districts; and collaboration with community agencies and resources.

PB82-875360 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pension and Retirement Plans. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 183p
Supersedes PB81-850836.

This bibliography contains citations concerning private pensions and capital formation forecasting models, comparison of active and terminated pension plans, state roles in local government financial management, forecasting occupational behavior under alternative retirement systems, financial planning for retirement, and an in-depth analysis of the needs assessment of the elderly. (This updated bibliography contains 159 citations, 34 of which are new entries to the previous edition.)

PB82-876301 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Employee Benefits: Disability Compensation. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1975-Sep 82.
Sep 82, 331p
Supersedes PB81-850125.

The citations in this bibliography cover permanent disability benefits in the workers' compensation program. Analysis of current laws reflecting worker benefits for occupational diseases, pre-ERISA plan termination benefit losses, and the union impact on employee benefits. Severance pay programs and the laws protecting union members and their pension and welfare benefits are also included in this bibliography. (This updated bibliography contains 308 citations, 93 of which are new entries to the previous edition.)

PB82-927911 PC **E10**/MF **A01**
Central Intelligence Agency, Washington, DC.
Directory of Officials of the Republic of Cuba.
Jul 82, 325p CR-82-13380
Supersedes PB81-927914.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all other write for quote. This series offers a reduction in price as a Standing Order, PB82-927900.

The report is a reference aid that contains a comprehensive listing of party and government officials, organizations and Cuban diplomatic representation abroad.

PB82-927912 PC **E02**
Central Intelligence Agency, Washington, DC.
Czechoslovak Communist Party.
Wall chart.
Jul 82, 9p CR-82-10200
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-927900.

The Reference Aid is a personality photo wall chart depicting the leadership of the Czechoslovak Communist Party.

PB82-927913 PC **E02**
Central Intelligence Agency, Washington, DC.
Bulgarian Communist Party Leadership.
Wall chart.
Jul 82, 9p CR-82-11023
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-927900.

The reference aid is a personality photo wall chart of the Bulgarian Communist Party leadership.

PB82-927914 PC **E02**
Central Intelligence Agency, Washington, DC.
Government of the Czechoslovak Socialist Republic.
Wall chart.
Jul 82, 9p CR-82-10202
Supersedes NTISUB/E/279014.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-927900.

The Reference Aid is a personality photo wall chart depicting the leadership of the government of the Czechoslovak Socialist Republic.

PB82-927915 PC **E02**
Central Intelligence Agency, Washington, DC.
Government of the People's Republic of Bulgaria.
Wall chart.
Jul 82, 5p CR-82-11024
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-927900.

The Reference Aid is a personality wall chart depicting the leadership of the People's Republic of Bulgaria.

5J. Psychology (Individual and Group Behavior)

AD-A118 495/1 PC **A04**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Computerized Adaptive Testing System Design: Preliminary Design Considerations.
Interim rept. 1 Oct 79-30 Sep 81,
Paul R. Croll. Jul 82, 52p Rept no. NPRDC-TR-82-52

A functional design model for a computerized adaptive testing (CAT) system was developed and presented through a series of hierarchy plus input-process-output (HIPO) diagrams. System functions were translated into system structure; specifically, into 34 software components. Implementation of the design in a physical system was addressed through brief discussions of hardware, software, interfaces, and personnel requirements. Further steps in CAT system development were identified, including design testing, evaluation, and refinement. Both micro- and minicomputer-based hardware configurations were evaluated and found capable of supporting test administration and station monitoring. The functional design model and the system structure specified in this report were recommended for the Department of Defense CAT system. (Author)

AD-A118 575/0 PC **A22**/MF **A01**
Wisconsin Univ.-Madison. Motor Behavior Lab.
Coding, Organization and Feedback Variables in Motor Skills.
Final rept.,
George E. Stelmach. Apr 82, 517p 10, AFOSR-TR-82-0620
Grant AFOSR-78-3691

The major theoretical accomplishment of this research effort is the application of organizational concepts derived from control theory to models of motor control. Experimental results of this effort include: (1) a demonstration that there is genuine interactivity of two limbs under a number of bimanual conditions, (2) evidence that rapid error corrections are dependent on efference rather than on afferent input indicating the existence of internal feedback that monitors efferent commands, (3) descriptions of spatial orientations within egocentric space, and (4) specification of the role of organizational processes in motor learning and control. (Author)

AD-A118 612/1 PC **A02**/MF **A01**
Air Force Aerospace Medical Research Lab., Wright-Patterson AFB, OH.
Cognitive Performance during Long-Duration Vibration.
Technical rept.,
Richard W. Shoenberger, and C. Stanley Harris. Jul 82, 14p Rept no. AFAMRL-TR-81-57

No abstract available.

AD-A118 668/3 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Field-Dependence, Extraversion, Eysenck and Autarky,
Bernard J. Fine. 29 Jun 82, 7p Rept no. USARIEM-M-37/82

The research literature was examined with regard to relationships between field-dependence and extraversion. Eysenck's contention that the two variables are significantly related to an extent justifying the use of casual hypotheses based on extraversion theory to account for field-dependent behavior was not supported. (Author)

AD-A118 730/1 PC **A03**/MF **A01**
Portland State Univ., OR. Dept. of Psychology.
Models and Estimation Procedures for the Analysis of Subjects-by-Items Data Arrays.
Final technical rept.,
James A. Paulson. 30 Jun 82, 33p Rept no. TR-82-1
Contract N00014-79-C-0214

This final report describes results obtained in a study of models and estimation procedures for the analysis of subjects-by-items data arrays. The results include a new transformation to render an array additive and some simple empirical Bayes methods for estimating subject and item marginal effects. Unfortunately, the problems which these results concern are not as central to the problems of model-based psychological measurement as I originally thought. The report discusses a new problem which I began working on roughly midway through this project, a problem which is crucial for the foundations of model-based mastery testing.

PB82-876368 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Organizational Behavior. November, 1973-September, 1982 (Citations from the NTIS Data Base).
Rept. for Nov 73-Sep 82.
Sep 82, 361p
Supersedes PB81-850265.

This bibliography contains citations concerning an introduction to group relations and organization diagnosis, managing with performance measures in government, performance based leadership development in organizational settings, studies on intergroup relations and behavior in organizations, and improving individual and group performance effectiveness. Institutionalization of planned organizational change is also included in this bibliography. (This updated bibliography contains 290 citations, 90 of which are new entries to the previous edition.)

5K. Sociology

AD-A118 464/7 PC **A04**/MF **A01**
Academy of Health Sciences (Army), Fort Sam Houston, TX. Health Care Studies Div.
Child Protection and Case Management Team Performance Evaluation Tool (CPCMT P.E.T.).
Final rept.,
Theodore P. Furukawa, and Charles M. Waits. May 82, 58p Rept no. HCSD-82-004

The study was requested by HQ HSC for the purpose of developing a standard CPCMT Performance Evaluation Tool for use by Army child protection teams. A staff group of subject-matter experts employed the Delphi Technique (two iterations), and a panel comprising representation from all CONUS CPCMTs served as respondents. The resulting performance evaluation tool is a three-part, 26-item form which is recommended for use by CPCMTs and for inclusion in future revisions of regulations and directives. (Author)

AD-A118 742/6 PC **A02**/MF **A01**
Navy Personnel Research and Development Center, San Diego, CA.
Assessing Alternative Military Family Housing Assignment Policies.
Final rept. Aug 80-Feb 82, .
Robert Hutchins, and Murray Rowe. Aug 82, 19p Rept no. NPRDC-TN-82-24

The Government Accounting Office (GAO), in a 1979 report, recommended that priority for assignment to military family housing be given to personnel who can least afford to live off base (E-1--E-3). The purpose of this effort was to evaluate modifications to the current DoD family housing assignment policy that address GAO's criticism. Central to the evaluation is a computer program, the Housing Assignment Policy (HAP) model, that assesses the impact of a change in assignment policy by simulating the effects of a specific set of priorities or rules. The number, type (pay grade), and location of personnel affected, as well as the associated changes in budgetary costs, specifically basic allowance for quarters (BAQ), were derived for numerous scenarios and compared. Although changes in housing policy would affect morale and retention, such effects are difficult to measure and were not included in this work. (Author)

PB82-201054 PC **E12**/MF **A01**
Opinion Research Corp., Princeton, NJ.
Public Attitudes Toward the Swine Flu Immunization Program,
Walter J. Gunn. Jan 81, 762p HHS/CDC/CHPE-82-0178

Beginning in August 1976, the Opinion Research Corporation conducted 9 monthly national opinion surveys (with approximately 1,500 adults in each survey) to determine (1) awareness of the swine flu problem and the Swine Flu Immunization Program, (2) the level of potential demand for the vaccine, (3) sources of information about the shot, (4) knowledge of where to obtain a shot, (5) reasons for indecision or procrastination, and (6) perceived barriers to immunization.

PB82-253006 PC **A06**/MF **A01**
Center for Research on the Acts of Man, Philadelphia, PA.
Policy Implications of the Camden WIN Study.
Final rept.,
Samuel Z. Klausner. Jan 82, 123p DLETA-51-42-79-02-3
Contract DL-51-42-79-02

Part I presents direct lessons for policy of the substantive findings of research on the Work Incentive Program in Camden, N.J. Cultural orientations of families override any other factors in determining the family's welfare history and the type and duration of work sought. The fundamental orientations are termed traditional and modernizing. The first maintains the priority of family life over any other social participation and the

second characterizes the family seeking to locate itself productively in a political and economic civic community transcending the family. Religious organizational involvements are salient discriminants of these two styles of life. The Work Incentive Program itself is modified in the light of these cultural orientations at the local level through a negotiation between the government agencies and family members. Part II develops general concepts for the design of poverty and manpower programs. Poverty is defined as an ideology. Three distinct types of impoverished are identified: the unemployed proletariat generated by failures in the system of production; the abandoned dependents generated by changes in the family structure and norms; and outcasts generated by strains in the system of ethnic and race relations. Each type calls for a distinct meliorative approach. Poverty is a condition of the total society and therefore, programs targeted on the poor alone will be ineffective.

PB82-258831 PC **A02**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
Arson Resource Exchange Bulletin.
Jul 82, 18p

The report is a non-periodic publication of the Federal Emergency Management Agency of the U.S. Fire Administration. It includes a feature article and news items or publications in management, investigation, economics, and behavior as related to arson.

PB82-259482 PC **A06**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Rural Organizations in South India: The Dynamics of Laborer and Tenant Unions and Farmer Associations in Kerala and Tamil Nadu,
K. C. Alexander. Jun 79, 105p RLO-2, AID-PN-AAJ-633
Contract AID/ta-BMA-8

Rural organizations, prominent features in agrarian development, are capable of transforming political and socioeconomic relationships. This study examines the emergence of peasant organizations in the Indian districts of Kerala and Tamil Nadu. The report describes the various agricultural laborer and tenant organizations and tiller and farmer associations and the factors affecting membership and participation. The report addresses the political polarization which peasant movements have brought about. The report concludes that India's poor are divided into hostile groups which for the time being will prevent development of organizations embracing all sections of the rural poor.

PB82-259615 PC **A03**/MF **A01**
Agency for International Development, Washington, DC.
Creating a 'Women's Component': A Case Study in Rural Jamaica,
Elsa M. Chaney, and Martha W. Lewis. Mar 81, 41p AID-PN-AAJ-466
Portions of this document are not fully legible.

To incorporate women into an ongoing integrated rural development project (IRDP) in central Jamaica, USAID's Office of Women in Development (WID) designed and implemented a women's component for the project. This case study documents the genesis of this component and offers suggestions for its potential replication. After a year of operation, IRDP staff were concerned that unless women were involved in project planning and implementation, the IRDP's scope would be restricted to the soil conservation activities which are its main focus and not address the larger concerns of improving the lives of the area's 5,000 families.

PB82-260134 PC **A05**/MF **A01**
Cornell Univ., Ithaca, NY. Rural Development Committee.
Reaching the Assetless Poor: Projects and Strategies for Their Self-Reliant Development.
Special series on landlessness and near-landlessness,
Cheryl A. Lassen. Oct 80, 76p LNL-6, AID-PN-AAJ-647
Contract AID/ta-BMA-8

The only assets the landless and near-landless (LNL) possess are their labor and their capacity for collective action. This report questions whether restricting the LNL's participation in development efforts to implementation and reception of benefits without allowing them to participate in the decisionmaking, management, and evaluation processes produces the structural changes needed for long-run, self-reliant development. Because developing country governments often extend only to the district level, lack concrete knowledge of the LNL's situation, and rely on intermediary institutions which favor local elites, the LNL must form themselves into clientele groups to effectively seek public goods and services. To spur this organizing process, catalyst agencies are needed to motivate, inform, and organize the LNL.

PB82-260217 PC **A09**/MF **A01**
Agency for International Development, Washington, DC.
Women in Mauritania: The Effects of Drought and Migration on their Economic Status and Implications for Development Programs,
Melinda Smale. Oct 80, 194p AID-PN-AAJ-464

What effects did the drought of the 1970's and male migration have on the lives and income-generating ability of Mauritanian women. This report, based on a study of selected sites in Mauritania, answers that question. A Mauritanian woman's ability to earn an income is largely dictated by her ethnic group. Drought and migration are not new to Mauritania, but the drought of the last 10 years increased and lengthened male absences. Women have responded and adapted in their own characteristic way. Recommendations to increase women's income from productive activities are given by the author.

PB82-260290 PC **A06**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Rural Development Programs and Their Impacts on Fertility,
Abraham S. David, Laurie Zivetz, Edward Vickery, and William Levine. 1979, 107p AID-PN-AAJ-630
Grant AID/ta-CA-1

To increase its ability to build antifertility strategies into rural development programs (RDP's), A.I.D. sponsored a series of state-of-the-art papers on the impact of RDP's on fertility decisions. This report presents executive summaries of these papers, along with a framework for synthesizing their key findings. The papers treat, in order, the fertility impact of RDP's that focus on women's roles; education; urban-rural migration; the cost/value of children; land tenure; income; and health/nutrition. Each paper includes an annotated bibliography of pertinent literature, an inventory and fertility-related analysis of hypotheses found in the literature, and an executive summary.

PB82-263096 PC **A09**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report: The Mascot Saloon Group, Historic Buildings 35H, 35G, and 35F, Historical and Architectural Data Sections, Klondike Gold Rush National Historical Park, Skagway, Alaska, 1897-1980,
David E. Snow, and Robert L. Spude. Sep 81, 183p FNP-400-82-36
Errata sheet inserted.

Included in this report are the Historical and Architectural Data Sections of the Historic Structure Report for the Mascot Saloon Group. Alternatives for treatment and recommended treatments for the Mascot group - buildings are presented in graphic as well as written form. The Historical Data Section discusses the development of this parcel of land in 1897 by three speculators - J.A. 'Doc' Cleveland, Captain Elias W. Johnston, and Otto Wolf. The effects of the Klondike Gold Rush on the establishment of Skagway is presented briefly. The report contains illustrations and drawings.

PB82-263542 PC **A14**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report: Historic Data Section, Part 1, and Historic Grounds Study, Old Courthouse, Jefferson National Expansion Memorial, National Historic Site, St. Louis, Missiouri, 1839-1960,
John H. Lindenbusch. Jan 82, 314p FNP-400-82-37

This Historic Structure Report is an account of the history of the interior and the grounds of the Old Courthouse. The Old Courthouse, now occupied by area headquarters, was built in sections beginning in 1839 and was completed in 1862. The report discusses the early construction and expansion phases, the structure's completion, renovation of the rotunda in 1880-1902, its decline from 1915-1940, and the eventual preservation and rehabilitation 1940-1960 of the courthouse.

PB82-265174 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Civilian Deaths: Causegroup by Injury Data.
1981, 35p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265232 PC **A04**/MF **A01**
Administration for Children, Youth and Families, Washington, DC.
Family Day Care in the United States: Executive Summary. Final Report of the National Day Care Home Study,
1981, 63p DHEW/PUB/OHDS-80-30287

The purpose of this research was to describe family day care populations, programs, processes, costs, administrative structures and place in the community. Family day care is nonresidential child care provided in a private home other than the child's own. Encompassing a myriad of unique arrangements between families and their day care providers, family day care constitutes the largest, most complex system of child care in the United States. It is distinguished from care in a day care center, nursery school or other group facility as well as from substitute care provided in the child's own home. Family day care is composed of three major categories delineated by regulatory and administrative structure. The largest of these categories consists of unregulated providers who operate informally and independently of any regulatory system. A second category consists of regulated (licensed or registered) caregivers who meet state and/or federal standards but, except for this link with the broader day care community, operate independently. The third and smallest group of providers consists of regulated homes which are operated as part of day care systems or networks under the administrative auspices of a sponsoring agency.

PB82-265331 PC **A08**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report, Architectural Data Section, Pier 1 and 2. Volume I: Historical Background, Charlestown Navy Yard, Boston National Historic Park, Massachusetts,
Mary Jane Brady. Jan 82, 156p FNP-400-82-34
See also Volume 2, PB82-265349.Portions of this document are not fully legible.

This is a technical document prepared for use in the preservation of a significant historical resource. It describes the structural development of Pier 1 and Pier 2, while placing that development in a historical context. Pier 1 is a solid wharf bounded by a concrete arch zone that extends along the east side and outboard end of the pier. Pier 2 of the Dry Dock is a timber pile wharf located immediately east. This report describes the structural development of the structures.

PB82-265349 PC **A15**/MF **A01**
Childs Engineering Corp., Medfield, MA.
Historic Structure Report, Architectural Data Section, Pier 1 and Pier 2. Volume II: Structural Engineering Investigation and Evaluation, Charlestown Navy Yard, Boston National Historic Park, Massachusetts.
Rept. for 1978-81.
Jan 82, 350p FNP-400-82-35
See also Volume 1, PB82-265331.Portions of this document are not fully legible. Color illustrations reproduced in black and white.

This historic structure report is a structural investigation and evaluation of Pier 1 and Pier 2 of the Charlestown Navy Yard. It is divided into three sections: Structural engineering investigation and evaluation of bulk-

heads and Piers 1 and 2; structural investigation and evaluation of the Finger Pier; and drawings.

PB82-265497 PC **A04**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report, Architectural Data Section, Building HB-21, Interior Restoration of 1st Sergeant's Quarters Room and North Squad Room, Fort Davis National Historic Site, Fort Davis, Texas,
Frank S. Gerner. Dec 81, 56p FNP-400-82-40

This Historic Structure Report contains a brief Administrative Data Section and an Architectural Data Section with additional chapters on the Proposed Interior Restoration and the Proposed Future Restoration. Building HB-21 was the enlisted men's barracks at Fort Davis from 1869 to 1891. The National Park Service restored the exterior of HB-21, except the mess hall wing, between 1965 and 1968. The majority of the text deals with the architectural features of these rooms in relation to the building. Maps, drawings, illustrations, and paint sample analyses are included.

PB82-265505 PC **A14**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report, Jacob Riis Park Historic District, Historical Data, Gateway National Recreation Area, New Jersey-New York, 1904-1979,
Harlan D. Unrau. Apr 81, 323p FNP-400-82-39
Portions of this document are not fully legible due to the historical nature of some of the material.

This Historic Structure Report is a portion of a package dealing with the rehabilitation of the lands and facilities at Gateway National Recreation Area. The purpose of this study is to provide a thorough historic study of the Jacob Riis Park Historic District to insure that the stabilization/preservation treatment of the structures and sites is historically accurate. The following structures are included: Bathing Pavilion, Central Mall Buildings, Maintenance Shops and Garage, Refreshment Stands, Boiler Room, Golf Course Concession Stand, Electrical Hut, Landscape, and Clock. The Historical Data Section includes documentary and illustrative data on the background history of the area's development and the architectural evolution and uses of the designated structures and sites from the construction period to the present.

PB82-265513 PC **A08**/MF **A01**
National Park Service, Denver, CO. Denver Service Center.
Historic Structure Report, the Old Point Loma Lighthouse, Cabrillo National Monument, San Diego, California,
F. Ross Holland, Jr., and Henry G. Law. Mar 81, 159p FNP-400-82-38

This Historic Structure Report includes the Administrative, Historical, and Architectural Data Sections on the Old Point Loma Lighthouse. The Architectural Data Section was designed to satisfy the architectural research requirements for the preservation of the lighthouse. Cabrillo National Monument consists of 144 acres at the end of Point Loma. The principal historic structure at the monument is the Old Point Loma Lighthouse. It may be the only historic lighthouse of the early construction period of West Coast lighthouses to be preserved in perpetuity on the West Coast. The report discusses the construction of the lighthouse as well as the lighting and manning of the structure.

PB82-265596 PC **A08**/MF **A01**
National Park Service, Washington, DC.
Troop Movement Maps: Battle of First Manassas and Engagement at Blackburn's Ford, July 18 and 21, 1861, Manassas National Battlefield Park, Prince William and Fairfax Counties, Virginia.
Historical rept.,
Edwin C. Bearss. Sep 81, 170p FNP-400-82-42
Color illustrations reproduced in black and white.

The compilation and documentation of the First Manassas Historical Base and Troop Movement Maps is based on the review of the 'After Action Reports' of participants, unit histories of commands engaged in the campaign, journals, diaries, letters, and reminiscences of officers and enlisted men who fought at First Manassas and Blackburn's Ford, contemporary and post-Civil War maps of the battlefield and area, etc., found at the Library of Congress, National Archives, the Department of the Interior Library, the Manassas National Battlefield Park Library, and the U.S. Army Military History Institute at Carlisle, Pennsylvania.

PB82-265604 PC **A03**/MF **A01**
National Highway Traffic Safety Administration, Washington, DC.
The Effect of Raising the Minimum Legal Drinking Age on Traffic Accidents in the State of Maine,
Terry M. Klein. Dec 81, 34p DOT-HS-806 149

Traffic accidents related specifically to alcohol use have been shown to be highly correlated with the age and sex of the drivers involved. This relationship reflects the lifestyle of American males, especially of young, unmarried males. Data from the Fatal Accident Reporting System (FARS) for ten States with good BAC reporting, shows that 55 percent of the fatally injured young adults had an illegal BAC of .10 percent or higher. By age 17, 43 percent of all fatally injured drivers in these States had some alcohol in their bodies, and 29 percent had an illegal BAC. This report analyzes the effect of raising the legal drinking in Maine from 18 to 20 years of age.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A118 621/2 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Rabbit Fibrinogen: Time Course of Constituent Chain Production in Vivo,
Barbara M. Alving, Soo Il Chung, Genesio Murano, Douglas B. Tang, and J. S. Finlayson. 12 Feb 82, 11p
Pub. in Archives of Biochemistry and Biophysics, v217 n1 p1-9 Aug 82.

No abstract available.

AD-A118 657/6 PC **A02**/MF **A01**
Walter Reed Army Inst. of Research, Washington, DC.
Cyclic Adenosine 3',5'-Monophosphate in Amygdaloid-Kindled Rats.
Research note,
Vernice E. Bates, G. Jean Kant, Robert H. Lenox, and James L. Meyerhoff. 18 Jan 82, 8p
Pub. in Experimental Neurology, v77 p459-464 1982.

No abstract available.

AD-A118 818/4 PC **A03**/MF **A01**
Exxon Research and Engineering Co., Linden, NJ.
Artificial Red Cells with Polyhemoglobin Membranes.
Final rept. 1 Oct 80-30 Jun 81,
Thomas A. Davis, William J. Asher, and George T. Quinlan. Sep 81, 43p
Contract DAMD17-80-C-0179

Artificial red cells were prepared with polyhemoglobin membranes. Red-cell-size microdroplets containing 30% of hemoglobin were held in liquid membrane capsules and treated with glutaraldehyde that cross linked the hemoglobin at the surface of each microdroplet. A water-soluble surfactant was used to eject the cells from the oil and suspend them in saline. The hemoglobin was retained by the artificial red-cell membrane, but biotonometry revealed that it held oxygen more tenaceously after encapsulation. (Author)

N82-29372/1 PC **A03**/MF **A01**
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
Oxygen-Transporting Compounds.
I. Tyuma. 1982, 34p NRC/CNR-TT-2020, ISSN-0077-5606
Transl. Into English from Kagaku Zokan (Japan), No. 89, 1981 p 25-39.

The principal characteristics of the oxygen-transporting proteins found in nature are summarized. All of the compounds listed are macromolecules consisting of monomers with a molecular weight exceeding 10,000 each. Two typical respiratory proteins, hemoglobin and myoglobin, are discussed. Artificial protein models are considered. Fluorocarbon derivatives as artificial oxygen carriers are discussed.

6B. Bioengineering

N82-29864/7 PC **A03**/MF **A01**
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
The Utilization of Macromolecules in Blood Purification Systems.
K. Takakura, and T. Nakashima. 1982, 31p NRC/CNR-TT-2021, ISSN-0077-5606
Transl. Into English from Kagaku Zokan (Japan), No. 84, 1980 p 141-152.

The macromolecular membranes and adsorbents that play essential roles in blood purification sytems, as well as materials that are used to coat the adsorbents, are discussed. The KF 101 dialyzer employs hollow fibers made of an ethylene-vinyl alcohol copolymer (EVA). The DHP-1 blood purifier utilizes activated charcoal coated with hydroxyethyl methacrylate (HEMA). These macromolecules are discussed from the standpoint of their medical utility.

N82-29896/9 PC **A05**/MF **A01**
Southwest Research Inst., San Antonio, TX.
A Functional Video-Based Anthropometric Measuring System.
Final Report.
J. H. Nixon, and J. P. Cater. 28 May 82, 78p NASA-CR-167637, NAS 1.26:167637
Contracts NAS9-16158, SWRI PROJ. 16-6141

A high-speed anthropometric three dimensional measurement system using the Selcom Selspot motion tracking instrument for visual data acquisition is discussed. A three-dimensional scanning system was created which collects video, audio, and performance data on a single standard video cassette recorder. Recording rates of 1 megabit per second for periods of up to two hours are possible with the system design. A high-speed off-the-shelf motion analysis system for collecting optical information as used. The video recording adapter (VRA) is interfaced to the Selspot data acquisition system.

6C. Biology

AD-A118 628/7 Not available NTIS
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
Botulism in Juvenile Coho Salmon (Oncorhynchus kisutch) in the United States,
M. W. Eklund, M. E. Peterson, F. T. Poysky, L. W. Peck, and J. F. Conrad. 14 Jul 81, 12p ARO-17061.2-LS
Contract ARO-MIPR-12-82
Availability: Pub. in Aquaculture, v27 p1-11 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 631/1 Not available NTIS
California Univ., Berkeley. Naval Biosciences Lab.
Midgut Cellular Responses to Bloodmeal Digestion in the Mosquito, Culex tarsalis Coquillett (Diptera: Culicidae),
Edward J. Houk, and James L. Hardy. 14 Dec 81, 11p

Contracts N00014-81-C-0570, DAMD17-77-C-7018
Availability: Pub. in International Jnl. of Morphology and Embryology, v11 n2 p109-119 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

PB82-260969 PC **A03**/MF **A01**
National Park Service, Atlanta, GA. Southeast Regional Office.
The Distribution of Exotic Woody Plants at Cumberland Gap National Historical Park.
Research/Resources Management rept.,
Terri Butler, Donald Stratton, and Susan Bratton. Jun 81, 44p R/RM/SER-52

The purpose of this study was to locate and quantify populations of woody exotic plants in Cumberland Gap National Historical Park (Ky.-Va.-Tenn.) and to determine their effects on the park's native vegetation. A total of 20 woody exotic species were located and evaluated in terms of site distribution, total area, degree of spread, and effects on native species. Some suggestions regarding exotic plant control and management are also presented.

PB82-263245 PC **A04**/MF **A01**
National Park Service, Atlanta, GA. Southeast Regional Office.
The Vascular Flora of Shiloh National Military Park, Hardin County, Tennessee.
Research/Resources Management rept.,
Ronald L. Jones, and Peter S. White. Sep 81, 59p R/RM/SER-50

A floristic study at Shiloh National Military Park, Hardin County, Tennessee, documented the presence of 112 families, 375 genera, and 655 species of vascular plants. Four hundred and seven new records for Hardin County are reported. Woody plants contribute 25 percent of the flora, with 72 trees, 65 shrubs, and 26 woody vines. A geographical analysis revealed that 62.0 percent of the flora is eastern, while 21.8 percent of the flora is southern and 4.6 percent is central in affinity. No rare species of national significance were found, but one plant, Carex howei, is a special concern plant in Tennessee.

6D. Bionics

AD-A118 474/6 PC **A05**/MF **A01**
Ohio State Univ. Research Foundation, Columbus.
An Experimental Study of an Ultra-Mobile Vehicle for Off-Road Transportation.
Semi-annual technical rept. 1 Oct 81-31 Mar 82,
Robert B. McGhee, and Kenneth J. Waldron. Aug 82, 92p
Contract MDA903-82-K-0058

This report summarizes research accomplished during the first six months of a project aimed at field testing of an experimental vehicle making use of an actively controlled suspension system for improved off-road mobility. The first year of this project involves component evaluation and concept verification with reduced-scale laboratory models. Preliminary test results and projections of performance to be expected in the full-scale vehicle are included in this report. (Author)

N82-29899/3 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC.
An Overview of Expert Systems.
W. B. Gevarter. May 82, 73p NASA-CR-169197, NAS 1.26:169197
Sponsored by NASA.

An expert system is defined and its basic structure is discussed. The knowledge base, the inference engine, and uses of expert systems are discussed. Architecture is considered, including choice of solution direction, reasoning in the presence of uncertainty, searching small and large search spaces, handling large search spaces by transforming them and by developing alternative or additional spaces, and dealing with time. Existing expert systems are reviewed. Tools for building such systems, construction, and knowledge acquisition and learning are discussed. Centers of research and funding sources are listed. The state-of-the-art, current problems, required research, and future trends are summarized.

6E. Clinical Medicine

AD-A118 524/8 PC **A02**/MF **A01**
Brigham Young Univ., Provo, UT. Dept. of Microbiology.
Chemical Interactions with Herpes Simplex Type 2 Virus: Enhancement of Transformation by Norharman,
F. Brent Johnson. 24 Nov 81, 4p AFOSR-TR-82-0636
Grant AFOSR-80-0209
Pub. in Carcinogenesis, v3 n4 p457-459 1982.

No abstract available.

AD-A118 530/5 PC **A02**/MF **A01**
Brigham Young Univ., Provo, UT. Dept. of Microbiology.
Chemical Interactions with Herpes Simplex Type 2 Virus: Enhancement of Transformation by Hydrazine and 1,2-Dimethyihydrazine,
F. Brent Johnson. 16 Mar 81, 18p AFOSR-TR-82-0626
Grant AFOSR-80-0209
Pub. in Chemical Biological Interactions, v40 p97-112 1982.

No abstract available.

AD-A118 622/0 PC **A02**/MF **A01**
Naval Dental Research Inst., Great Lakes, IL.
Empirical Verification of Confidence Intervals Computed from Dental Data.
Research progress rept.,
M. E. Cohen, and J. C. Cecil. 4 Aug 81, 7p Rept no. NDRI-PR-82-07
Pub. in Jnl. of Dental Research, v61 n6 p824-827 Jun 82.

No abstract available.

AD-A118 623/8 PC **A08**/MF **A01**
Beth Israel Medical Center, New York. Dept. of Pathology.
Studies on the Mechanism and Prevention of Decompression Sickness.
Final technical rept. 1 Jun 68-28 Feb 82,
Chryssanthos Chryssanthou. 12 Jul 82, 155p
Contract N00014-75-C-0312

The studies focused on three main areas: Decompression Sickness, Dysbaric Osteonecrosis and Dysbaric Alteration of the Blood-Brain Barrier. On decompression sickness, attempts were made to elucidate pathogenetic mechanisms. Several hypotheses were advanced and novel pathogenetic concepts were proposed. On the basis of new theoretical considerations we were able to develop means for the prevention or amelioration of the disease. Regarding dysbaric osteonecrosis, we developed an animal model which permitted studies on the etiology predisposition and pathogenesis of the disorder. The most recrnt investigations covered by this report involve dysbaric modification of blood-tissue barriers, an observation which was made in our Laboratories few years ago. The report includes an overview (summary) of the investigations conducted in these areas with references to pertinent publications. In lieu of detailed description of the work done, reprints to pertinent publications. In lieu of detailed description of the work done, reprints of representative articles have been attached. We hope that this material might be of help to those interested in the fields of dysbaric disroders.

AD-A118 651/9 Not available NTIS
Langley Porter Neuropsychiatric Inst., San Francisco, CA.
An Information Processing Model for Schizophrenia,
Enoch Callaway, and Steven Naghdi. 4 Nov 81, 9p
Contract N00014-75-C-0398, Grant PHS-RR-05755
Availability: Pub. in Archives of General Psychiatry, v39 p339-347 Mar 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 759/0 PC **A03**/MF **A01**
Peter Bent Brigham Hospital, Boston, MA.
Factors Influencing Renal Vasculature during Anesthesia, Trauma, and Oliguric Renal Failure States in Man.
Final rept. Sep 63-Feb 79,
John P. Merrill. Mar 80, 31p
Contracts DA-49-193-MD-2497, DAMD17-74-C-4023

Micropuncture studies revealed a reduction in both proximal tubular pressure and glomerular filtration rate in animal models of acute renal failure, making a vascular or glomerular mechanism the most attractive. Application of arteriography and xenon washout to assessing renal cortical perfusion in man revealed a global reduction in patients with acute renal failure sufficient to account for the failure of filtration and function. An identical hemodynamic and angiographic picture in patients in whom acute renal failure followed shock, hemolysis, sepsis, and a wide variety of pharmacologically and chemically unrelated nephrotoxins suggested an intrarenal final common pathway. Investigations in this laboratory revealed a striking influence of prior sodium intake on the pathogenesis of acute renal failure, raising the possibility that the renin-angiotensin system was involved. This led to an exploration of the role of angiotensin in the control of the normal renal circulation, where it plays a key role, and to a systematic exploration of angiotensin antagonists and their influence on the renal circulation. Because in models of acute renal failure the angiotensin antagonist led to a drop in blood pressure, major recent investigation was oriented toward developing agents with increased specificity for the kidney. Most recent investigation has involved the exploration of intraglomerular angiotensin receptors which appear to differ from those in the vasculature. (Author)

AD-A118 779/8 PC **A02**/MF **A01**
Army Inst. of Dental Research, Washington, DC.
Incidence of Pain or Discomfort Following an Operative Treatment: A Review.
Rept. for 1981-1982,
P. S. Grover, J. Hollinger, and L. Lorton. 19 Aug 82, 8p

The incidence of dental pain or perioral pain after one-visit restorative dental procedures can be attributed to many possible origins. The presence or absence of pain in carious teeth probably depends on the rate of development of the cavity and on the extent to which an impermeable barrier is formed on the inner side of the dentin. Once the decay is removed, the cavity is repaired, the barrier is broken and there may be postoperative pain or discomfort. This paper presents a review on the possible sources of postoperative pain after one session of operative treatment. (Author)

HRP-0902168/4 PC **A02**/MF **A01**
Western Center for Health Planning, San Francisco, CA.
Financial Impairment in the Health Care Industry - Implications for Health Planning,
Larry Y. Wilson. 14 Feb 80, 16p TECHNICAL ASSISTANCE MEMO-45
Prepared by Booz-Allen and Hamilton, Inc., Bethesda, MD.

Like the steel and railroad industries, health care requires significant investment in assets with long depreciable lives. The same insidious effects of inflation operate in the health care industry, largely through the under-depreciation of plant and equipment. Conventional accounting statements (based on historical costs) do not adequately reflect the true economic condition of the enterprise. Important insights can be derived from adjusting and analyzing financial statements to reflect the true economic value of assets. To be in a position to maintain its capital base, the hospital industry must improve its operating performance. However, the external environment is making such improvements more difficult. In addition, improved operating performance in the form of higher charges, while necessary to maintain the capital base, may not be possible in certain competitive situations. Thus, while inflation-adjusted financial statements may provide invaluable guidelines for pricing, other constraints may inhibit the institution's ability to follow such guidelines.

HRP-0904329/0 PC **A02**/MF **A01**
Institute for Health Planning, Inc., Madison, WI.
Analysis of Variance.
Data technical note series,
Carol V. Getts. Jul 82, 23p IHP/TN/SER-82-2
Contract PHS-HRA-232-79-0036

This data technical note, one of a series prepared to help health planners and decisionmakers deal with specific analytic techniques, explains how to interpret the results of analysis of variance. Analysis of variance is used to determine whether a relationship exists between two or more variables. The first section of this data technical note explains why this statistical test is important. The second section introduces the basic terminology used in analysis of variance and uses these terms in studying variations in hospital expenditures per admission. The effects of geographic region and for-profit ownership on hospital expenditures per admission are examined using this technique. The third section points out additional statistical considerations.

N82-29848/0 PC **A03**/MF **A01**
George Washington Univ. Medical Center, Warrenton, VA. Dept. of Medical and Public Affairs.
Biomedical Research Publications: 1980 - 1982.
Final Report.
L. Pleasant, and L. Limbach. Jul 82, 49p NASA-CR-3587, NAS 1.26:3587
Contract NASW-3165

Publications concerning the major physiological and psychological problems encountered by man when he undertakes space flight are listed. Nine research areas are included: cardiovascular deconditioning, motion sickness, bone alterations, muscle atrophy, blood cell alterations, fluid and eletrolyte changes, radiation effects and protection, behavior and performance, and general biomedical research.

N82-29865/4 PC **A04**/MF **A01**
Technology, Inc., Houston, TX. Life Sciences Div.
Neurochemical Background and Approaches in the Understanding of Motion Sickness.
Final Report.
R. L. Kohl. Jul 82, 54p NASA-CR-3569, NAS 1.26:3569
Contract NAS9-14880

The problems and nature of space motion sickness were defined. The neurochemical and neurophysiological bases of vestibular system function and of the expression of motion sickness wre reviewed. Emphasis was given to the elucidation of the neuropharmacological mechanisms underlying the effects of scopolamine and amphetamine on motion sickness. Characterization of the ascending reticular activating system and the limbic system provided clues to the etiology of the side effects of scopolamine. The interrelationship between central cholinergic pathways and the peripheral (autonomic) expression of motion sickness was described. A correlation between the stress of excessive motion and a variety of hormonal responses to that stress was also detailed. The cholinergic system is involved in the efferent modulation of the vestibular hair cells, as an afferent modulator of the vestibular nuclei, in the activation of cortical and limbic structures, in the expression of motion sickness symptoms and most likely underscores a number of the hormonal changes that occur in stressful motion environments. The role of lecithin in the regulation of the levels of neurotransmitters was characterized as a possible means by which cholinergic neurochemistry can be modulated.

PB82-253147 PC **A05**/MF **A01**
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, 1976-1980) Hematology and Biochemistry Data Tape: Laboratory Procedures Used by the Clinical Chemistry Division, Centers for Disease Control, for the the Second Health and Nutrition Examination Survey (HANES II) 1976-1980.
Final rept.
15 Jun 82, 76p NCHS/DF-82/018B
For system on magnetic tape, see PB82-253162.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the period 1976-1980, was designed to measure and monitor the nutritional survey, NHANES I, was conducted from 1971-1975. During NHANES II, data were collected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trials, electrocardiograms, body measurements, puretone audiometry, speech and allergy tests, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. This data tape contains demographic characteristics of 20,322 examined sample persons ages 6 months through 74 years and selected hematological and biochemical blood findings from NHANES II. The determinations include hemoglobin, hematocrit, red blood cell count, white blood cell count, serum iron, serum total iron-binding capacity, transferrin saturation, serum albumin, serum vitamin C, serum zinc, serum copper, serum vitamin A, erythrocyte protoporphyrin, lead and carboxyhemoglobin.

PB82-253154 PC **A05**/MF **A01**
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, 1976-1980) Hematology and Biochemistry Data Tape, Catalog Number 5411.
Final rept.
15 Jun 82, 84p NCHS/DF-82/018A
For system on magnetic tape, see PB82-253162.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the period 1976-1980, was designed to measure and monitor the nutritional survey, NHANES I, was conducted from 1971-1975. During NHANES II, data were cOllected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trials, electrocardiograms, body measurements, puretone audiometry, speech and allergy test, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. This data tape contains demographic characteristics of 20,322 examined sample persons ages 6 months through 74 years and selected hematological and biochemical blood findings from NHANES II. The determinations include hemoglobin, hematocrit, red blood cell count, white blood cell count, serum iron, serum total iron-binding capacity, transferrin saturation, serum albumin, serum vitamin C, serum zinc, serum copper, serum vitamin A, erythrocyte protoporphyrin, lead and carboxyhemoglobin.

PB82-253162 CP **T02**
National Center for Health Statistics, Hyattsville, MD. Div. of Health Examination Statistics.
NHANES II (National Health and Nutrition Examination Survey, 1976-1980) Hematology and Biochemistry Data Tape, Catalog Number 5411.
Data file,
Cliff Johnson, and Mary Dudley. 1980, mag tape NCHS/DF-82/018
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-253147, and PB82-253154.

The Second National Health and Nutrition Examination Survey (NHANES II), conducted during the peiod 1976-1980, was designed to measure and monitor the nutritional statu and health of the U.S. population ages 6 months through 74 years. A similar survey, NHANES I, was conducted from 1971-1975. During NHANES II, data were collected by means of a household questionnaire, medical histories, dietary questionnaires, a physical examination, spirometry trails, electrocardiograms, body measurements, puretone audiometry, speech and allergy test, x-rays, a medication/vitamin usage questionnaire, a behavior questionnaire and laboratory analyses of blood and urine samples. There were a total of 27,801 sample persons of which 25,286 were interviewed and 20,322 were examined. This data tape contains demographic characteristics of 20,322 examined sample persons ages 6 months through 74 years and selected hematological and biochemical blood findings from NHANES II. The determinations include hemoglobin, hematocrit, red blood cell count, white blood cell count, serum iron, serum total iron-binding capacity, transferrin saturaion, serum albumin, serum vitamin C, serum zinc, serum copper, serum vitamin A, erythrocyte protoporphyrin, lead and carboxyhemoglobin.

PB82-259573 PC **A04**/MF **A01**
Columbia Univ., New York.
Family Planning: Its Impact on the Health of Women and Children,
Deborah Maine. 1981, 60p AID-PN-AAJ-557
Contract AID/DSPE-CA-0043

The enormity of the maternal/child health problems facing developing countries is evident from the fact that two-thirds of their people are either children under 15 or women of child-bearing age. This report explores how family planning (FP) can help avoid or reduce some of these problems. Using research data from 37 developing and developed countries, the author shows that a child's chances of surviving the first few years of life are reduced if children are born close together in time; the family already has three or more children; and the mother is under 20 or over 35. The author recommends continuing and expanding FP programs in developing countries. An 87-item bibliography (1938-81) in English and Spanish is appended.

PB82-262403 PC **A02**/MF **A01**
Assam Agricultural Univ., Jorhat (India). Directorate of Research.
Mineral Deficiency Symptoms of Three High Yielding Varieties of Rice.
Research bulletin no. 5,
D. N. Chakravarty, and B. C. Barthakur. Jun 80, 14p
Color illustrations reproduced in black and white.

Since sufficient work has not yet been done to study the visible nutritional disorders of major nutrient elements in rice, an attempt was made to study the visible deficiency symptoms of these elements in three popular high yielding varieties of rice of Assam. This report contains the experiment and the results. It was found that the deficiency symptoms caused due to lack of nitrogen appeared within 7 days from the date of transplanting and these were followed by sulphur, potassium, calcium, magnesium, and phosphorous, in that order, and the absence of any of the major elements and their combinations reduced plant growth and root development to a considerable extent.

PB82-262981 PC **A02**/MF **A01**
Raad voor Gezondheidsresearch TNO, The Hague (Netherlands).
Unity of Conceptions Is a Problem of All Centuries and Especially Today,
W. M. Hirs, and B. Verwaart. Apr 80, 10p

Unification is an attempt to achieve some agreement on salient intersections in our use of the terminology, the different classes and the coding of data. Such an agreement is not necessary on each intersection of professional or organizational communication. Fortunately the range of the unification can be restricted to: (1) a fixed language and geographical area: the Netherlands; (2) a segment of society: the health care: administration and statistics; (3) a professional area: the health disciplines; and (4) a secondary information source: common definitions, classification standards, uniform identification.

PB82-263328 PC **A03**/MF **A01**
Bureau of Health Education, Atlanta, GA.
The Health Education Center, Pittsburgh, PA.
1982, 29p HHS/CDC/CHPE-82-0171

The Health Education Center is a project of the Health and Welfare PLANNING Association (HWPA), a United Way agency in Pittsburgh, Pennsylvania. The Center, which serves a 10-county area with a population of 3 million, provides information, technical assistance, and direct education to consumers, public and private health and educational organizations, and business and industry. The Center's major functions are program development, provision of information and communication services, and evaluation of and research on health education programs in the region. In addition to approximately 30 volunteers, the staff includes 8-11 professionals representing competencies in administration, communication, community organization, evaluation, health education, nursing, and planning.

PB82-263419 PC **A03**/MF **A01**
Bureau of Health Education, Atlanta, GA.
Background Paper on Rural Health Education,
Jeannette J. Simmons. Aug 81, 39p HHS/CDC/CHPE/82-0049

The health programs and services in rural areas over the past 50 years have been parallel in many ways to the changes which have occurred in urban areas. However, the proportion of resources allocated to rural health have been far less. As one article pointed out, the rural population has not had an effective advocacy group for health. The rural population has had effective

voices for agricultural support, rural electrification, roads, and other economic conditions. There are some indications from this review of literature that a number of organizations and groups now are coming together in a united effort to express their concerns about the neglect of rural health especially of those who reside in small and often isolated communities.

PB82-263427 PC **A02**/MF **A01**
American Hospital Association, Chicago, IL.
Discharge Planning: Reviewing the Issues.
1976, 9p HHS/CDC/CHPE-82-0101
Contract DHEW-200-75-0542

Discharge planning encompasses all planned events that focus on the alleviation of patients' problems that might prevent their regaining a normal and productive role following initial health care. The process usually incorporates the efforts of patients' families and a multidisciplinary team of health care workers. In an effort to ensure continuity of comprehensive care, discharge planning involves attention to the rehabilitative aspects of care, provision of personnel to provide the care, and coordination of services.

PB82-263450 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Measurement Lab.
Reference Materials for Organic Nutrient Measurement: Proceedings of a Workshop held at the National Bureau of Standards, Gaithersburg, Maryland, October 23, 1980.
Final rept.,
Sam A. Margolis. Aug 82, 54p NBS-SP-635
Library of Congress catalog card no. 82-600575. Sponsored in part by Food and Drug Administration, Washington, DC., Department of Agriculture, Washington, DC., and National Food Processors Association, Berkeley, CA.

This publication contains seven formal presentations which provided the framework for three workshop sessions. Each workshop session focused on one of three groups of nutrients: (1) cholesterol, fat, and fat-soluble vitamins; (2) water-soluble vitamins; or (3) sugars. Each workshop session reported on the state-of-the-art in measurement techniques, suggested matrices which are appropriate for Standard Reference Materials (SRM's), and indicated areas where there were problems in measurement methodology. These recommendations are included in this publication.

PB82-263484 PC **A05**/MF **A01**
Bureau of Health Education, Atlanta, GA.
Review and Evaluation of Smoking Control Methods: The United States and Canada, 1969-1977,
Jerome L. Schwartz, and Gail Rider. Dec 78, 93p
HHS/CDC/CHPE/82-0117

An evaluative review of smoking control methods used in the United States and Canada from 1969 to 1977 is presented. Smoking cessation methods reviewed include self-care techniques, techniques employing medications, non-profit programs, commercial methods, hypnosis, medically sponsored programs, programs undergoing research and development, mass media and community programs, and miscellaneous techniques. Nonprofit programs reviewed during the period included school programs, the 5-day plan, in-residence treatment programs, American Cancer Society Quit Smoking Clinics, Lung and Tuberculosis Association clinics, programs of the American Health Foundation, the Kaiser Foundation Stop-Smoking Clinic, Toronto Clinic programs, and other group programs. Medically sponsored techniques include surveys of the attitudes of health professionals, physician counseling and clinics, and multiple risk factor preventive trials. Control and cessation designs currently undergoing research include aversive procedures and self-management techniques. A list of doctoral dissertations published in 1970-1976 on smoking cessation methods are appended.

PB82-263690 PC **A04**/MF **A01**
Veterans Administration, Washington, DC.
1980 Supplement to Alcoholism and Problem Drinking, 1970-1975: A Statistical Analysis of VA Hospital Patients.
Biometrics Monograph no. 14,
Donald Stockford. Mar 82, 57p VA/82-6003
See also PB-291 775.

This monograph presents data regarding alcoholism and other drug abuse collected in the 1980 VA patient census, and describes trends in the proportion of alcoholism since 1970. Alcoholism among VA hospital and extended care facility patients was studied according to the following categories: Age, attained stay, compensation and pension status, marital status, region of residence, diagnosis, and race and ethnicity. Also discussed is drug abuse other than alcoholism. The VA concluded that the percentage of defined alcoholics or problem drinkers among hospitalized veterans increased from 20% in 1970 to 26% in 1980.

PB82-264185 Not available NTIS
National Bureau of Standards, Washington, DC.
The National Environmental Specimen Bank Pilot Program.
Final rept.,
S. H. Harrison, T. E. Gills, E. J. Maienthal, H. L. Rook, and S. A. Wise. 1980, 12p
Pub. in Proceedings of Symposium Trace Substances in Environmental Health XIV. 1980, Columbia, Missouri, June 10-12, 1980 p329-340 1980.

In response to the increasing concern for the potential dangers to human health and the environment by the influx of man-made substances in our ecosystem, the U.S. EPA, in cooperation with the National Bureau of Standards (NBS), is currently studying the feasibility of establishing a National Environmental Specimen Bank. Recently, a five year pilot program was initiated at NBS to provide experience in all phases of specimen banking, i.e. collection, storage evaluation and analysis. These activities have been implemented for the first sample included in this pilot study: human liver samples. This paper will describe the sampling protocol, homogenization procedure, storage evaluation, and analytical techniques employed for these liver samples.

PB82-264912 PC **A18**/MF **A01**
Washington Univ., Seattle. Dept. of Health Services.
Consumer Choice and Cost Containment: An Evaluation of SAFECO's United Healthcare Plan. Volume I: Final Report,
William C. Richardson, Diane P. Martin, Paula H. Diehr, Stephen H. Moore, and Kyle L. Grazier. Jun 82, 402p
Contract HCFA-18-97144
See also Volume 2, PB82-264920.
Also available in set of 3 reports PC E99, PB82-264904.

This study examines SAFECO's innovative health insurance plan, United Health Care (UHC), which attempted to control costs by placing participating primary care physicians (PCPs) 'at risk' for excess costs. The plan utilized PCPs as case managers and required enrollees to select a PCP and obtain the PCP's approval for all specialist and hospital care as a condition of insurance reimbursement. As an incentive for PCP's to control costs and utilization, a savings account was established for each PCP, out of which a year-end bonus was paid if the total reimbursement for the PCP's panel of enrollees was below the actuarial projection.

PB82-264920 PC **A11**/MF **A01**
Washington Univ., Seattle. Dept. of Health Services.
Consumer Choice and Cost Containment: An Evaluation of SAFECO's United Healthcare Plan. Volume II: Technical Appendices,
William C. Richardson, Diane P. Martin, Paula H. Diehr, Stephen H. Moore, and Kyle L. Grazier. Jun 82, 231p
Contract HCFA-18-97144
See also Volume 1, PB82-264912, and Volume 3, PB82-264938.
Also available in set of 3 reports PC E99, PB82-264904.

The study provides a narrative history of UHC, analysis of physician and enrollee participation, and a detailed comparative examination of the health insurance coverage impacts on health care utilization for State of Washington employees, who were offered a choice between UHC, a Blue Cross/Blue Shield major medical indemnity plan, and a prepaid group practice plan. This volume provides details regarding the sampling plan, index variable construction, data adjustments, distributions of utilization variables, and confidence intervals.

PB82-264938 PC **A22**/MF **A01**
Washington Univ., Seattle. Dept. of Health Services.
Consumer Choice and Cost Containment: An Evaluation of SAFECO's United Healthcare Plan. Volume III: Data Collection Instruments,
William C. Richardson, Diane P. Martin, Paula H. Diehr, Stephen H. Moore, and Kyle L. Grazier. Jun 82, 525p
Contract HCFA-18-97144
See also Volume 2, PB82-264920.Portions of this document are not fully legible.
Also available in set of 3 reports PC E99, PB82-264904.

This volume provides the interview schedules and related forms used to survey physicians and families, as well as manuals used for abstracting and coding health insurance claims and medical records.

PB82-265109 PC **A05**/MF **A01**
Vanderbilt Univ., Nashville, TN. School of Medicine.
Health Care among Tennessee Medicaid Recipients: Executive Summary and Final Report,
Rept. for 1 Dec 74-30 Nov 76,
Charles F. Federspiel. 31 Dec 80, 83p NCHSR-82-71
Grant PHS-HS-01703

This study has found that the use of routinely collected claims file data from the Tennessee Medicaid Program was suitable for health services research purposes. These data had potential for the analysis of physician prescribing patterns in an ambulatory population of Medicaid eligibles as well as the evaluation of professional activities review mechanisms. The use of this kind of data file was also found helpful for studies having to do with cost control of medical care provided under Government programs.

PB82-265141 PC **A02**/MF **A01**
Bureau of Health Education, Atlanta, GA.
Health Education for Youth in Primary Schools,
Roy Davis. Sep 79, 11p HHS/CDC/CHPE-82/0066

In the U.S. full scale attention is being directed to personal choice health behavior as a major component of primary prevention to deal with current disease and disability problems. The purpose of this presentation is to describe two innovative school health curriculum projects that are achieving unprecedented success in the U.S. Both are carried on under the auspices of the Federal Government's Bureau of Health Education and both are comprehensive health education models which put into practice many of the basic principles which health educators have long talked about, but which have seldom been assembled into operating and diffusable models.

PB82-265448 PC **A04**/MF **A01**
Bureau of Health Education, Atlanta, GA.
Health Education: Risk Reduction Grant Program,
J. J. Wittie. Nov 79, 74p HHS/CDC/CHPE-82-0048
See also PB82-256413.

In September 1979, the Bureau of Health Education awarded $3.6 million in grants for projects in health education-risk reduction to 46 State health departments, 2 local health departments, the District of Columbia, and the Virgin Islands to assist State and local health agencies in initiating and delivering health education programs that will emphasize those personal-choice health behaviors which can be modified to reduce excess morbidity and mortality.

PB82-265539 PC **A11**/MF **A01**
Indiana Univ. Medical Center, Indianapolis.
A Controlled Trial of a Quality Assurance Mechanism: Executive Summary and Final Report.
Rept. for 1 Mar 77-28 Feb 81,
Clement J. McDonald. 1982, 230p NCHSR-82-70
Grant PHS-HS-02485

The investigators initiated a two-year controlled clinical trial (both patients and physicians were randomized to study and control groups) of a new version of a medical record system in order to determine the long-term effects of the computerized reminders determine factors that influence physicians' response to such reminders. A total of 11 faculty members, 115 residents, 4 nurse-clinicians and over 12,000 patients participated in the study. Subject matter for the reminder logic covered all major subspecialties, and included recom-

mendations about preventive care, diagnostic workups, therapy, and test follow-up.

PB82-811480 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Health Care Costs: Ambulatory Health Care. September, 1975-September, 1982 (Citations from the NTIS Data Base).
Sep 82, 119p
Supersedes PB81-806440 and PB80-806896.

These selected abstracts of research reports cover medical group practice, health resources, health care facilities, rural health services, health care utilization, health insurance, chronic disease management, surgery, and community health services as related to health care costs of ambulatory health care. (This updated bibliography contains 112 citations. 4 of which are new entries to the previous edition.)

PB82-875725 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Lipid Metabolism. 1973-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1973-Sep 82.
Sep 82, 98p
Supersedes PB81-858581.

This bibliography contains citations concerning lipid metabolism as it relates to kidney disease and renal dialysis, myocardial infarct, exercise and diet. The effects of lipid reducing medications and the relationship of hyperlipidemia to anthrogenesis are also discussed. (This updated bibliography contains 70 citations, 22 of which are new entries to the previous edition.)

PB82-922905 PC**$4.50**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Dioxins and Dibenzofurans in Carcinogenesis.
Oncology overview.
Sep 82, 46p NCI/ICRDB/OK-82/05

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Experimental carcinogenicity studies of dioxins and dibenzofurans; Experimental animal studies of the metabolic and toxicologic effects of dioxins and dibenzofurans; Metabolic effects of dioxins and dibenzofurans in in vitro systems; Interactions of dioxins and dibenzofurans with receptors and macromolecules; Epidemiologic reports on the effects of exposure to dioxins and dibenzofurans; Environmental occurrence, public health issues and regulations concerning dioxins and dibenzofurans.

PB82-923005 PC**$6.00**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Hepatitis B Virus.
Oncology overview.
Sep 82, 100p NCI/ICRDB/OB-82/05

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Epidemiologic studies of the possible etiologic relationship between hepatitis B infection and primary hepatocellular carcinoma (PHC); Identification and characterization of hepatitis B antigens in liver tissue and blood of patients with primary hepatocellular carcinoma and/or other liver diseases; Association of hepatitis B infection with leukemias, lymphomas and other cancers; The hepatitis B vaccine, and other immunologic and biochemical aspects of hepatitis B infection; Establishment and characteristics of human hepatoma cell lines producing hepatitis B surface antigen; Animal studies with hepatitis B and woodchuck hepatitis viruses; Hepatitis B virus molecular biology; General reviews on hepatitis B virus.

PB82-923007 PC**$6.50**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Liposomes.
Oncology overview.
Sep 82, 122p NCI/ICRDB/OB-82/07

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Preparation of liposomes; Physicochemical properties of liposomes; Interactions of various substances with liposomes; Interactions of liposomes with cultured cells and tumors; In vitro evaluations of liposomes as carriers of drugs and other substances; Human and animal investigations of liposomes as carriers of drugs and other substances; Methods for improving localization of liposome-encapsulated substances; Use of liposomes to study the immune system; Use of liposomes to study cell membrane properties; Reviews and general articles on liposomes.

6F. Environmental Biology

AD-A118 512/3 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Dept. of Entomology.
A New Approach for the Control of Cockroaches Utilizing the Entomophilic Nematode DD-136 in Conjunction with Attractants.
Annual rept. no. 2,
G. Mallory Boush. Aug 82, 24p
Contract N00014-80-C-0080
See also AD-A107 458.

The pathogenicity of two different entomogenous nematodes (Neoaplectana carpocapsae and N. glaseri) for the German cockroach (Blattella germanica) was investigated. Infective juveniles of each test species were placed in an infection chamber consisting of a standard petri dish with filter paper. At sufficient concentrations, the invasive of N. carpocapsae (DD-136) reduced roach populations significantly. However, the invasive of N. glaseri proved considerably less virulent.

AD-A118 691/5 PC **A04**/MF **A01**
Science and Education Administration, Fort Lauderdale, FL. Aquatic Plant Management Lab.
Improving Technology for Chemical Control of Aquatic Plants.
Annual rept. for FY 1980,
Kerry K. Steward. Aug 82, 56p WES-MP/A-82-4
Contract USDA/SEA-12-14-7001-992

A protocol describing procedures for evaluating conventional and controlled-release herbicides was developed and tested during FY 1980. Progress on the implementation of the protocol and the results of the conventional herbicide evaluation program are discussed in this report. During FY 1980 the following compounds were evaluated in the laboratory: three controlled-release formulations, one coded-confidential compound, one growth retardant, and six conventional herbicide formulations. Moreover, iron chelates were evaluated for enhancing efficacy of diquat and potassium endothall against hydrilla.

AD-A118 693/1 PC **A06**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Large-Scale Operations Management Test of Use of the White Amur for Control of Problem Aquatic Plants. Selected Life History Information of Animal Species on Lake Conway, Florida.
Final rept.,
Nancy J. Zittleman, Randall R. Williams, and Eugene G. Buglewicz. Aug 82, 107p Rept no. WES/MP/A-82-5

This report summarizes, in tabular form, life history information for animal species identified at Lake Conway, Orlando, Fla. A total of 180 animal species were sighted or collected on Lake Conway during the period January 1976 through September 1977. This period coincides with the baseline period of the Lake Conway Large-Scale Operations Management Test to document the effects of the introduction of the white amur fish for control of the problem aquatic plant hydrilla. Information developed in this report will be used for subsequent analysis of the effects of the white amur on the Lake Conway ecosystem. (Author)

AD-A118 701/2 PC **A04**/MF **A01**
Orange County Pollution Control Dept., Orange, FL.
Large-Scale Operations Management Test of Use of the White Amur for Control of Problem Aquatic Plants. Report 3. Second Year Poststocking Results. Volume VI. The Water and Sediment Quality of Lake Conway, Florida.
Technical rept.,
H. Douglas Miller, and Rick Potts. Aug 82, 59p WES-TR-A-78-2-3-VOL-6
Contract DACW39-76-C-0084
See also AD-A117 385.

This report presents the results of the second annual poststocking period covering the 12-month period from September 1978 through August 1979. The data collected during this period were compiled in a format similar to that utilized in the baseline report and the first poststocking report. The compiled poststocking data were compared to the baseline data to determine if any significant changes had occurred subsequent to the introduction of the white amur to Lake Conway.

DE82014301 MF **A01**
Brigham Young Univ., Provo, UT. Dept. of Zoology.
Ferruginous Hawks and Geothermal Development. Annual Report.
C. M. White, and T. L. Thurow. 1 Jan 79, 23p DOE/ID/01674-T3
Contract AS07-77ID01674
Portions of document are illegible,
Best available copy from document source. Available in microfiche only.

The effects on nesting ferruginous hawks of impact treatments was studied. These treatments were undertaken as follows: 3 nests were visited on foot; 3 were visited by vehicle; 3 were disturbed by discharging firearms; and 2 were disturbed by placing continuously operating engines near them. Data recorded include the general behavior of adults, their presence or absence, time of visit, and conspicuous environmental conditions. Nest failures and young per attempted nesting are given and compared with controls. (ERA citation 07:046474)

DE82015172 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Results of Research to Develop Cost Effective Biomonitoring at Oil Shale Lease Tracts. Phase I. Fall Sampling Report.
J. R. Skalski, R. E. Fitzner, and K. A. Gano. May 82, 80p PNL-4216
Contract AC06-76RL01830

This report presents the results of censuses conducted during October 1981 to estimate the fall abundance of small mammals and avifauna on replicate plots in the vicinity of Federal Tract C-a (Rio Blanco Oil Shale Company). The objectives of the fall censuses were to evaluate alternative census techniques, test assumptions vital to the use of indices and abundance estimators, determine cost-functions associated with monitoring efforts, and estimate variance components needed to devise optimal monitoring designs. Analyses of the fall census data on small mammal abundance were performed.

DE82016079 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Occurrence of Fungi in Loose-Fill Attic Insulation in Typical Single-Family Dwellings.
C. S. Dudney, N. F. Hinkle, and J. M. Becker. May 82, 27p ORNL/CON-93
Contract W-7405-ENG-26
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Microfiche only after original copies are exhausted.

Attic insulation from 57 homes in Oregon, Colorado, and Florida was found to harbor viable fungal spores of at least 6 different general. The most abundant

genera found in this study coincide with the most abundant genera found in other studies of fungi in the air within living spaces of homes. All of these frequently found general include allergenic species. Attic air samples from the Oregon and Florida homes show that very few of the spores found in attics are airborne. There is no strong relationship between the level of fungal spores and either age, thickness, or type of insulating material. The implications of these results in terms of potential impacts on human health are also discussed. It is concluded that on the basis of the data presented there is no cause for increased homeowner concern with respect to the installation of loose-fill attic insulation.

DE82903730 MF **A01**
Battelle Columbus Labs., OH.
Evaluation of Terrestrial Microcosms for Assessing Ecological Effects of Utility Wastes. Interim Report.
P. Van Voris, M. F. Arthur, and D. A. Tolle. Apr 82, 180p EPRI-EA-2364
Portions of document are illegible.
Available in microfiche only.

The second year of a five year research proram was completed by Battelle's Columbus Laboratories to determine the utility of microcosms (intact agricultural soil cores) in assessing ecosystem response to various levels of fly ash. The Electric Power Research Institute funded this study to evaluate the suitability of microcosms as a technique for evaluating the potential environmental impacts of utility wastes prior to the adoption of this approach by government as a required test protocol. A range-finding test using unplanted microcosms dosed with fly ash was used to determine the appropriate nutrient indicators and fly ash treatment levels (0, 5, 9 and 27 metric tons/ha) for the definitive test. Fly ash was applied by uniform mechanical dusting on both microcosms and field plots planted with an alfalfa/clover crop for the definitive test. Soil water from both microcosms and field plots was analyzed for nutrient loss (total-, nitrate-, and ammonium-nitrogen, and dissolved organic carbon) and pH. In addition, comparisons between microcosms and field plots were made for net primary productivity and the uptake of 16 potentially toxic trace elements. Microcosms appear to be a cost-effective technique for tracking ecosystem processes such as nutrient loss and trace element uptake. Chemical characterization of the fly ash and trends in nutrient loss data indicated that nitrate nitrogen was the best early-warning indicator of system disruption from fly ash application, although treatment levels were insufficient to produce changes in crop productivity.

PB82-263864 PC **A16**/MF **A01**
Environmental Research Lab., Gulf Breeze, FL.
Symposium: Carcinogenic Polynuclear Aromatic Hydrocarbons in the Marine Environment Held at Pensocala Beach, Florida on 14-18 August 1978,
N. L. Richards, and B. L. Jackson. Jun 82, 421p EPA-600/9-82-013

This publication is a compilation of papers contributed by scientists who participated in the 'Symposium on Carcinogenic Polynuclear Aromatic Hydrocarbons in the Marine Environment' sponsored by the Environmental Protection Agency (EPA) Office of Energy, Minerals, and Industry and the Environmental Research Laboratory, Gulf Breeze, August 14-18, 1978, at Pensacola Beach. Participants addressed questions related to the impact of polynuclear aromatic hydrocarbons on the marine ecosystem: their physical, chemical, and biological fate after release into the aquatic environment; the current state-of-the-art for their detection and identification; and their potential for transfer to human food.

6H. Food

PATENT-4 343 262 Not available NTIS
Department of Health and Human Services, Washington, DC.
Laboratory Rat Feeder.
Patent,
John Hunziker, Jr. Filed 26 Mar 81, patented 10 Aug 82, 12p PB82-257981, PAT-APPL-6-247 713
Supersedes PB81-221210.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A feeding device and feed storage hopper for laboratory rats, adapted to be hung from the top and inside the animal cage, comprises a substantially rectangular feed chamber containing an open top and a downwardly sloped back panel.

PB82-259318 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Evaluation: FY 75 Total Diet Studies - Adult (7320.08).
Final rept.
16 Apr 79, 40p FDA/BF-82/91

A study was done to collect and analyze total diet samples from retail markets in 20 urban areas of the U.S. in order to determine levels of pesticide residues, PCBs, metals and other chemical contaminants in the diets of adults; and to identify problems or trends in the intakes of such contaminants.

PB82-259326 PC **A02**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Evaluation: FY 75 Selected Minerals in Foods Survey (7320.08C).
Final rept.
26 Jan 78, 17p FDA/BF-82/84

New technology and manufacturing practices may change the mineral composition of foods. FDA must decide whether or not these changes may adversely affect consumer health. This survey was done to determine the levels of four essential minerals (iron, iodine, calcium, and phosphorus) in retail market basket samples collected in 20 urban areas of the United States.

PB82-259334 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Evaluation: FY 75 Metals in Foods Survey (7320.13).
Final rept.
1 Aug 78, 31p FDA/BF-82/89

This survey was part of the effort of the Food and Drug Administration to determine the significance of dietary exposure to metals, to establish regulatory limits where necessary and monitor the possible trends in levels that may result from changing agricultural practices and processing technology. The substances examined include lead, cadmium, zinc, arsenic, selenium and mercury.

PB82-259342 PC **A02**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Evaluation: FY 76 Selected Minerals in Foods Survey - Adults, Infants and Toddlers (7320.59) (7320.63).
Final rept.
30 May 78, 20p FDA/BF-82/83

New technology and manufacturing practices may change the mineral composition of foods FDA must assess the effect of such changes on consumer health. This study was done to determine the copper, iron, magnesium, and manganese in 20 market basket samples which represent the adult total diet and were collected at retail in 20 urban areas of the United States. The study also determined the iodine, iron, calcium and phosphorus in 10 market basket samples which represented the infant and toddler total diet and were collected at retail in 10 urban areas of the United States.

PB82-259359 PC **A02**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Evaluation: FY 77 Selected Minerals in Foods Survey - Adults, Infants and Toddlers.
Final rept.
4 Jun 79, 20p FDA/BF-82/85

Because new technology and manufacturing practices may change the mineral composition of foods, a study was done to determine the content of certain minerals in foods. Copper, iron, magnesium, manganese, potassium and sodium were analyzed in 25 market basket samples representing the adult total diet. These samples were collected in 20 urban areas of the United States. The same minerals were analyzed in 12 market basket samples representing infant and toddler foods collected at the retail level in 11 urban areas of the U.S. and 1 urban area of Puerto Rico.

PB82-260498 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 76 Total Diet Studies - Infants and Toddlers (7320.58).
Final rept.
12 Mar 80, 41p FDA/BF-82/92

The objectives of the research are to determine the presence and level of pesticide residues, PCBs, selected metals, and other chemical contaminants in the dietary intakes of infants (6 months old) and toddlers (2 years old) by collection and analysis of total diet samples from retail markets in 10 widespread urban areas of the U.S.; and to identify any problems or trends in the intakes of such contaminants.

PB82-260506 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 77 Total Diet Studies - Infants and Toddlers (7320.74).
Final rept.
22 Oct 80, 39p FDA/BF-82/94

This study was done to determine the level of residues of pesticides (including herbicides and fungicides), PCB, selected metals, and other chemical contaminants in the diets of infants (6 months old) and toddlers (2 years old). Total diet samples were collected and analyzed, from retail markets in 11 widespread urban areas of the U.S. and 1 urban area of Puerto Rico.

PB82-260514 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Evaluation: FY 75 Total Diet Studies - Infant and Toddler (7320.33).
Final rept.
14 Feb 79, 43p FDA/BF-82/90

A study was performed to determine the presence and levels of pesticide residues, PCBs, selected metals and other chemical contaminants in the dietary intakes of infants (6 months old) and toddlers (2 years old) through the collection and analysis of total diet samples from retail markets in ten (10) widespread urban areas of the United States.

PB82-260589 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 78 Total Diet Studies - Infants and Toddlers (7305.002).
Final rept.
3 Dec 82, 36p FDA/BF-82/99

A study was performed to determine the level of pesticides, PCB and other industrial chemicals and selected elements in the diets of infants (6-months old) and toddlers (2 years old) in the U.S. The results indicated that zinc exceeded the Recommended Dietary Allowance (RDA) but not to the extent of posing a hazard. Other elements were within reasonable limits.

PB82-260597 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 78 Total Diet Studies - Adult (7305.003).
Final rept.
29 Dec 81, 38p FDA/BF-82/96

A study was done to determine the level of residues of pesticides, PCB and other industrial chemicals, and selected metals, in the dietary intake of a typical 15 to 20 year old American male. The results have been used to identify trends and compare levels found with

World Health Organization (WHO) or other recommended acceptable levels.

PB82-260605 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 77 Pesticides and Metals Program (7320.79).
Final rept.
16 Jul 81, 28p FDA/BF-82/87

This study was done to provide consumer protection by locating foods that contain unsafe levels of pesticides. It also provided a means of maintaining surveillance over pesticide identities and levels, and the presence and level of PCBs in foods. Background levels of lead, cadmium and zinc were also determined for selected food commodities, as well as mercury in fish.

PB82-260613 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 79 Total Diet Studies - Infants and Toddlers (7305.002).
Final rept.
26 May 82, 41p FDA/BF-82-97

This study was done to determine the level of pesticide residues (including selected herbicides and fungicides), PCBs and other industrial chemicals, and selected elements in the dietary intakes of infants (6 months old) and toddlers (2 years old), to determine if levels of contaminants are related on a geographical or seasonal basis; and to identify trends and compare U.S. levels found with World Health Organization or other acceptable levels.

PB82-260621 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 79 Pesticides and Metals in Fish Program (7305.007).
Final rept.
7 Apr 82, 33p FDA/BF-82-88

Because fish bioaccumulate certain chemicals, levels of chemical contaminants in their edible portion must be closely monitored. This study was done to determine levels of pesticides, industrial chemicals, and selected elements in domestic and imported fish sampled.

PB82-260639 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 77 Total Diet Studies - Adult (7320.73).
Final rept.
11 Dec 80, 36p FDA/BF-82/95

A study was performed to determine the level of pesticide residues, PCB, metals and other chemical contaminants in the dietary intake of adults, and to identify emerging problems and trends in the presence of such contaminants. Total diet samples from retail markets in 20 widespread urban areas of the U.S. were used.

PB82-260647 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY 76 Total Diet Studies - Adult (7320.57).
Final rept.
11 Dec 80, 38p FDA/BF-82/93

A study was performed to determine the level of pesticide residues, PCBs, metals and other chemical contaminants in the dietary intake of adults. Total diet samples from retail markets in twenty (20) widespread urban areas were used in the study.

PB82-260878 PC **A02**/MF **A01**
National Research Council, Washington, DC. Advisory Board on Military Personnel Supplies.
Advisory Board on Military Personnel Supplies Periodic Report: Committee on Food Service Equipment.
1982, 19p ABMPS-121
Contract DAAK60-79-C-0015

This report evaluates the Natick Laboratories Food Systems Equipment Division's approach to developing a mobile food service unit for the heat-and-serve concept of feeding in the field recently adopted by the U.S. Army.

PB82-262700 PC **A02**/MF **A01**
National Research Council, Washington, DC.
Conclusions and Recommendations Arising from a Workshop, Held June 3-4, 1982, to Determine Nutritional Requirements of Military Personnel in Protective Clothing.
Final rept.
Jul 82, 8p
Grant DAND17-82-G-9509

Military personnel required, because of enemy attack with chemical or biological warfare agents, to put on protective clothing will only be able to obtain nutrients, while in the clothing, as solutions via the drinking tube in their gas mask. The volume and composition of liquid that should be consumed to sustain, as far as is practicable, effective performance, are discussed. Recommendations are related to the duration of exposure (6 or up to 24 hours), the level of physical activity (sedentary, moderate or high workload) and wet-bulb globe environmental temperatures (temperate (15.6C), warm (21C), hot (27C)). The inability of any nutrient solution to ameliorate heat illness resulting from heavy work in the clothing in a hot environment is noted.

PB82-265398 PC **A03**/MF **A01**
Food and Drug Administration, Washington, DC. Bureau of Foods.
Compliance Program Report of Findings: FY75 Pesticide Program (7320.07) and FY76 Pesticides and Metals Program (7320.55).
Final rept.
29 Apr 80, 33p FDA/BF-82/86

This report covers an evaluation of two Compliance programs and was done to provide consumer protection by locating foods that contain unsafe levels of pesticides; to maintain surveillance over pesticides and the presence and level of PCBs in food; and to determine background levels of metals for selected food commodities in FY 76.

PB82-874835 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Sunflower Oil. July, 1976-September, 1982 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for Jul 76-Sep 82.
Sep 82, 318p
Supersedes PB80-850035.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the preparation and use of sunflower oil. The chemical composition, production, refining, hydrogenation, and oxidation stability are discussed. The physiochemical and toxicological properties of heated oil are also considered. (This updated bibliography contains 345 citations, 145 of which are new entries to the previous edition.)

PB82-875154 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Retort Pouches: Design and Applications. 1976-September, 1982 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Sep 82.
Sep 82, 336p
Supersedes PB81-871907.

This bibliography contains citations concerning the development, design, and use of the retort pouch. Materials to produce the pouches and the machinery to make, fill, and seal them is discussed. Advantages, applications, microbial hazards, and factors affecting quality changes of the products are considered. Regulations are also discussed. (This updated bibliography contains 241 citations, 117 of which are new entries to the previous edition.)

PB82-875402 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Food: Encapsulation. 1972-September, 1982 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 108p
Supersedes PB80-855190.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the methods and applicatons of encapsulation and microencapsulated substances. The encapsulation of flavorings, aroma compounds and preservatives to foods, including dairy and meat products, fruits, chewing gum, and condiments are discussed. The composition of specific capsule matrices are considered. (This updated bibliography contains 120 citations, 26 of which are new entries to the previous edition.)

PB82-876046 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Frozen Meat and Meat Products. 1972-September, 1982 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 355p
Supersedes PB81-865651.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the freezing and storage of meat and the effects these methods have on the quality of the meat or meat product. Freezing methods, the chemical deterioration of muscle protein, the influence of temperature and moisture loss, microbial contamination, and the influence of proper handling before storage are discussed. (This updated bibliography contains 329 citations, 106 of which are new entries to the previous edition.)

PB82-876327 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ultrasonic Techniques in the Food Industry. 1972-September, 1982 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 225p
Supersedes PB81-868606.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the use of ultrasonics in the food industry. The uses are varied and include the preservation, maturing, and purification of food stuffs. These include the clarification of wine and fruit juices. cold sterilization, the maturing of spirits, emulsification, and homogenization. Other uses include the processing of fish and meat products. (This updated bibliography contains 234 citations, 84 of which are new entries to the previous edition.)

PB82-876434 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Essential Oils Used in the Food and Beverage Industry. 1972-September, 1982 (Citations from the Food Science and Technology Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 95p
Supersedes PB81-881831.Prepared in cooperation with the International Food Information Service, Frankfurt am Main (Germany, F.R.).

This bibliography contains citations concerning the sources and extraction processes of the essential oils used by the food and beverage industry. Steam and vacuum distillation extraction processes are included, and odor evaluation and physio-chemical changes occuring in the oils during food storage are considered. The GRAS(generally recognized as safe) status of many essential oils is discussed. (This updated bibliography contains 88 citations, 15 of which are new entries to the previous edition.)

6J. Industrial (Occupational) Medicine

DE82008586 PC **A02**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.

Contributions of Occupational Epidemiologic Studies to Radiation Protection.
S. Marks. 1982, 8p PNL-SA-9690, CONF-820613-6
Contract AC06-76RL01830
International symposium of the Society for Radiological Protection, Inverness, UK, 6 Jun 1982.

Early evidence of health effects of occupational radiation exposure contributed importantly to the establishment of exposure standards, especially for internal emitters. Standards derived in this manner for radium body burdens and for air concentrations of radon and its daughters were especially influential. The body burden limits for plutonium and other bone-seeking radionuclides were based upon the radium standard. The exposure controls instituted as a consequence of those early limits have reduced the exposure of worker populations to the extent that the current, more sophisticated epidemiologic studies will probably not influence the revision of existing standards. The justification for conducting such studies is discussed.

DE82009175 PC **A06**/MF **A01**
Department of Energy, Washington, DC. Office of Operational Safety Programs.
Guidelines for Performing Safety Analysis Activities and for Reviewing Safety Analyses.
Feb 82, 108p DOE/EP-0044-Dr
Portions of document are illegible.

These guidelines were written to assist Department of Energy (DOE) line organizations in implementing the Department of Energy Order DOE 5481.1A, Safety Analysis and Review system. This document is intended primarily for the use of organizations that may not have performed formal safety analyses before or who question whether past practices for the performance of safety analyses meet the requirements of Order DOE 5481.1A. Information is given on the background against which Order DOE 5481.1A was written and assistance in interpreting the requirements of the Order. This guidance covers the performance of a safety analysis, its review, and the related documentation required in the Order. While providing general guidance on the format and content of safety analyses, this document does not specify a mandatory format or required contents. Considerable flexibility is permitted in the performance of safety analyses. In the same way, this document describes a fairly generic approach to the performance of safety analysis reviews. Questions as to what should be of concern to organizations that have not previously reviewed safety analyses are addressed. (ERA citation 07:043805)

DE82013514 PC **A07**/MF **A01**
Oak Ridge National Lab., TN.
Survey of Potential Health and Safety Hazards of Commercial-Scale Ethanol Production Facilities.
A. P. Watson, J. G. Smith, and J. L. Elmore. Apr 82, 139p ORNL/TM-7817
Contract W-7405-ENG-26
Portions of document are illegible.
Microfiche only after original copies are exhausted.

Generic safety and health aspects of commercial-scale (60 to 600 million L/y) anhydrous ethanol production were identified. Several common feedstocks (grains, roots and fibers, and sugarcane) and fuels (coal, natural gas, wood, and bagasse) were evaluated throughout each step of generic plant operation, from initial milling and sizing through saccharification, fermentation, distillation, and stillage disposal. The fermentation, digestion, or combustion phases are not particularly hazardous, although the strong acids and bases used for hydrolysis and pH adjustment should be handled with the same precautions that every industrial solvent deserves. The most serious safety hazard is that of explosion from grain dust or ethanol fume ignition and boiler/steam line overpressurization. Inhalation of ethanol and carbon dioxide vapors may cause intoxication or asphyxiation in unventilated areas, which could be particularly hazardous near equipment controls and agitating vats. Contact with low-pressure process steam would produce scalding burns. Benzene, used in stripping water from ethanol in the final distillation column, is a suspected leukemogen. Substitution of this fluid by alternative liquids is addressed. (ERA citation 07:044849)

DE82014245 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Toxicity of Silicon Compounds.
K. M. Novak. Jun 81, 14p BNL-51509
Contract AC02-76CH00016

Silica toxicity was reviewed relative to assessing the health risks from a developing photovoltaic industry. Mechanism of physiological damage, possible exposure pathways of concern, and potential occupational and public hazards were examined. Acute and chronic effects were differentiated and appropriate methods for quantitative risk assessment described. (ERA citation 07:044825)

DE82014389 PC **A04**/MF **A01**
Lovelace Biomedical and Environmental Research Inst., Albuquerque, NM. Inhalation Toxicology Research Inst.
Potential Health and Environmental Effects of the Fluidized-Bed Combustion of Coal.
F. A. Seiler, C. H. Hobbs, and R. G. Cuddihy. Jan 82, 62p LMF-90
Contract AC04-76EV01013

A summary of the potential health and environmental effects of burning coal by fluidized bed combustion is presented. An increased use of coal combustion as a whole, an increasing fraction of which may be burned at the low temperature of fluidized bed combustors (FBC), is causing concern about potential health and environmental effects. The following concerns, in particular, are addressed: the use of coal and the FBC market penetration projected for the year 2000; the use of raw materials and the production of effluents and wastes by the industry; the health risks to both workers and the public of operating the power plant and of mining, transporting and preparing the raw materials necessary and disposing of the wastes; the environmental levels of effluents and waste products; and the resulting damage to human health, the environment, and materials. Results of a first analysis of the health and environmental risks due to coal combustion in FBC power plants show the following main areas of concern: acid deposition in the environment from atmospheric releases of sulfur and nitrogen oxides; possible climatic changes due to a carbon dioide buildup in the atmosphere; trace elements mobilized by the mining of coal and limestone; health effects resulting from occupational accidents; occupational diseases due to inhalation of coal dust; accidents connected with the transport of raw and waste materials; and public health effects due to industrial effluents. (ERA citation 07:044834)

DE82903042 MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario).
Annual Safety Report 1979.
A. R. Gibson, and C. G. Seymour. Dec 80, 64p
ASRA-2
U.S. Sales Only. Available in microfiche only.

This report discusses the safety of AECL's operations during 1979. A summary is provided and subsequent sections deal with exposure of staff to radiation, occupational injuries, the handling of radioactive wastes, and the discharge of material into the environment. (ERA citation 07:048257)

DE82903361 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.
Plans for Emergency Medical Care for Radiation Accidents Involving Irradiated Personnel. Body Decontamination.
G. Palumbo. Jul 81, 21p CNEN-RT/DISP-(81)8
In Italian.
U.S. Sales Only. Available in microfiche only.

This paper describes general aspects and rules of intervention on accidentally irradiated and contaminated people; the schematization proposed, by its very structure, allows to get acquainted with dosimetric investigations, diagnostics and therapeutics. The need for experts in this field and basic research tools has also been stressed in the article. (ERA citation 07:044791)

NUREG-0714-V1 PC **A06**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Occupational Radiation Exposure Report, Twelfth Annual Report 1979,
B. Brooks, S. McDonald, and E. Richardson. Aug 82, 108p
See also NUREG-0713-V2.c

This report summarizes the information reported for calendary year 1979 by all NRC licensees to the Commission's centralized repository of personnel occupational radiation exposure information. The bulk of the information in the report is derived from annual reports that were required to be submitted by all NRC licensees pursuant to 10CFR 20.407. This is the second year that all NRC licensees were required to submit an annual exposure report. Previously only certain categories - commercial nuclear power reactors, industrial radiographers, fuel fabricators and processors and commercial distributors of byproduct materials - of NRC 1 licensees had submitted such reports. The requirement of 10CFR 20.408 for the submission of termination reports continued to apply to only these four categories, and some analysis of the data contained in these reports is also presented. A brief description of personnel overexposures reported by NRC licensees is included as well.

PB82-221888 MF **A01**
Bureau of Labor Statistics, Washington, DC.
Occupational Injuries and Illnesses, California, 1981.
Final rept.
1982, 1979p BLS/SDS/CA-81
See also PB82-126178.
Microfiche copies only (Ten sheets 42X reduction).

Microfiche of Standard Tabulations produced by the Supplementary Data System (SDS). These microfiche contain 62 tabulations of occupational injury and illness data classified and provided to BLS by the Division of Labor Statistics and Research of the California Department of Industrial Relations. Included are data on the characteristics of the injury or illness (i.e., Nature, Part, Source, Type, and Associated Object or Substance), industry, occupation, age, and sex of the injured or ill employee, day of the week of the injury or illness, duration of employment of the employee, and fatalities. Data include a weighted sample of cases received during 1981 involving death, or 1 or more lost workdays. Data include cases arising in private employments, except for employees covered by Federal workers' compensation or employers' liability acts, certain household workers, corporate officers who are sole shareholders, and certain partners, and in public employments, except Federal employees. Some excepted employments may appear in the data due to voluntary coverage provisions of the law.

PB82-242793 MF **A01**
Bureau of Labor Statistics, Washington, DC.
Occupational Injuries and Illnesses, Oregon, 1981.
Final rept.
1982, 1453p BLS/SDS/OR-81
See also PB82-126244.
Microfiche copies only (Seven sheets 42X reduction).

Microfiche of Standard Tabulations produced by the Supplementary Data System (SDS). These microfiche contain 58 tabulations of occupational injury and illness data classified and provided to BLS by the Oregon Workers' Compensation Department. Included are data on the characteristics of the injury or illness (i.e., Nature, Part, Source, and Type), industry, occupation, age, and sex of the injured or ill employee, month and day of the week of the injury or illness, and kind of insurance coverage carried by the employer. Data include all cases received during 1981 involving death, permanent disability, 4 or more days of temporary disability, or 1 to 3 days of temporary disability during which the worker is hospitalized. Data include cases arising in private employments, except for employees covered by Federal workers' compensation or employers' liability acts, some casual employees, household workers, corporate officers, sole proprietors and partners, employees performing gardening, maintenance, repair, remodelling, or similar work in or about the employer's private home, newspaper carriers if accident insurance is provided, employees engaged in interstate commercial transportation whose employer has no fixed place of business in the State, certain equipment owners and leaseholders, and persons working in return for board and lodging received from religious, charitable, or relief organizations, and in public employments, except Federal employees, volunteer firefighters, and employees of municipalities of populations greater than 200,000 which provide comparable benefits. Some excepted employments may appear in the data due to voluntary coverage provisions of the law.

PB82-242801 MF **A01**
Bureau of Labor Statistics, Washington, DC.
Occupational Injuries and Illnesses, Missouri, 1981.
Final rept.

1982, 1487p BLS/SDS/MO-81
See also PB82-126210.
Microfiche copies only (Eight sheets 42X reduction).

Microfiche of Standard Tabulations produced by the Supplementary Data System (SDS). These microfiche contain 54 tabulations of occupational injury and illness data classified and provided to BLS by the Division of Workmen's Compensation of the Missouri Department of Labor and Industrial Relations. Included are data on the characteristics of the injury or illness (i.e., Nature, Part, Source, and Type), industry, occupation, age, and sex of the injured or ill employee, hour of shift of the injury, and weekly wage of the employee. Data include all cases which occurred during 1981 involving death, permanent disability, 1 or more lost workdays, medical treatment even if no lost workdays are involved, or loss of or damage to prosthetic devices. Data include cases arising in private employments, except for employees covered by Federal workers' compensation or employers' liability acts, household workers, corporate officers, sole proprietors and partners, farm workers, and employees of small (4 or fewer employees or annual payroll $10,000 or less) nonfarm employers, and in public employments, except Federal employees, and employees of political subdivisions with less than 5 employees or annual payroll $10,000 or less. Some excepted employments may appear in the data due to voluntary coverage provisions of the law.

PB82-242819 MF **A01**
Bureau of Labor Statistics, Washington, DC.
Occupational Injuries and Illnesses, Colorado, 1981.
Final rept.
1982, 1816p BLS/SDS/CO-81
See also PB82-120650.
Microfiche copies only (Nine sheets 42X reduction).

Microfiche of Standard Tabulations produced by the Supplementary Data System (SDS). These microfiche contain 82 tabulations of occupational injury and illness data classified and provided to BLS by the Division of Labor of the Colorado Department of Labor and Employment. Included are data on the characteristics of the injury or illness (i.e., Nature, Part, Source, Type, and Associated Object or Substance), industry, occupation, age, and sex of the injured or ill employee, month and day of the week of the injury or illness, hour of shift of the injury, duration of employment of the employee, and the extent of disability, and indemnity compensation associated with the injury or illness. Data include all cases received during 1981 involving death, or mre than 3 shifts or calendar days of disability, and cases closed during 1981 involving death, permanent disability, or 4 or more days of disability. Data include cases arising in private employments, except for employees covered by Federal workers' compensation or employers' liability acts, casual employees, most household workers, sole proprietors and partners, certain maintenance workers, certain farm or ranch workers, and officers of agricultural corporations, and in public employments, except Federal employees, noncompensated elected or appointed officials, and some volunteer firefighters. Some excepted employments may appear in the data due to voluntary coverage provisions of the law.

PB82-256942 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HHE-80-160-897, Emery Industries, Inc., Los Angeles, California,
Arvin G. Apol, and Theodore Thoburn. Jun 81, 13p HHE-80-160-897

In July 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request from the International Chemical Workers Union, Local 11, to determine if a potential health hazard existed to seven employees from exposure to lauric acid during the flaking and bagging operations at Emery Industries, Incorporated, Los Angeles, California. Curently, there is no specific standard for lauric acid. Because of its irritating properties, neither the Occupational Safety and Health Administration (OSHA) nuisance dust standard, 15 mg/cu M, or the American Conference of Governmental Industrial Hygienists' threshold limit value of 10 mg/cu M, would be applicable. From the general complaints about skin and mucous membrane irritation and the lack of a reduction in pulmonary functions, it appears the workers at Emery Industries were suffering from local irritation of moist body surfaces (eyes, throat, sweaty skin, etc.) from exposure to lauric acid. Although the time-weighted average exposure to airborne concentrations of lauric acid are low, it is possible that irritation of the eyes, nose, throat, and skin results from high short-term exposures during certain jobs. This is evidenced by the symptoms experienced by the bagger operators. Recommendations that will aid in reducing these exposures are included in the body of the full report.

PB82-256967 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-052-896, Marble Products of Memphis, Memphis, Tennessee,
Richard W. Gorman. Jun 81, 17p HETA-81-052-896

In October 1980, the National Institute for Occupational Safety andHealth (NIOSH) received a request for a Health Hazard Evaluation from Marble Products of Memphis, Memphis, Tennessee. The two co-owners, who were also the primary operators of the company, were concerned that exposure to the vapors and dust generated during manufacture of synthetic marble products might be a health hazard. Workers experienced occasional mild headaches and slight stomach discomfort which they felt may be work related. However, the major complaint was a strong, disagreeable odor noted particularly during the gelcoat and pouring phase of production. On the basis of the data obtained in this investigation, NIOSH determined that occupational exposures at Marble Products of Memphis do not exceed OSHA standards. However, in light of the growing body of evidence suggesting that styrene may be carcinogenic, it would be prudent to further minimize exposures. Accordingly, the body of the full report discusses methods of accomplishing this goal.

PB82-258104 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-290-906, Social Security Office, Newburgh, New York,
Nicholas Fannick. Jun 81, 10p HETA-81-290-906

In April 1981, the Regional Office of Facilities, Engineering, and Construction (ROFEC), Department of Health and Human Services, requested that the National Institute for Occupational Safety and Health (NIOSH) perform a Health Hazard Evaluation at the Social Security Administration (SSA) Office, 473 Broadway, Newburgh, New York. The request specified that there was a problem at the office with 'odors.' On April 24th, the manager of the office was telephoned and he indicated that carbon monoxide exposures may be involved after recent changes to the office's air supply system. Although no excessive exposures to contaminants were detected during the NIOSH survey, an inspection of the air handling system disclosed several conditions which could affect the quality of the air supplied to the office. Recommendations are made to correct those conditions in the body of the full report.

PB82-258112 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-015-898, Bradford Western Corporation, Arvada, Colorado,
Theodore W. Thoburn, and Bobby J. Gunter. Jun 81, 12p HETA-81-015-898

In October 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request from an employee at Carmen, Incorporated, Arvada, Colorado, to evaluate exposures to water heater insulation (thought to be asbestos) and paint fumes generated during the manufacture of hot water heaters at an adjacent warehouse operated by Bradford Western Corporation, Arvada, Colorado. No titanium dioxide was detected in the samples. Xylene levels ranged from 0.45 to 0.64 mg/cu M. Levels for 1,1,1-trichloroethane ranged from 0.54 to 1.62 mg/cu M. There was no n-butanol detected in the samples. All samples were less than 1% of the NIOSH evaluation criteria and Occupational Safety and Health Administration (OSHA) standards. On the basis of the environmental and medical data, NIOSH concluded that a health hazard did not exist under the present operating procedures from exposures to titanium dioxide, xylene, 1,1,1-trichloroethane, and n-butanol at Bradford Western Corporation's warehouse in Arvada, Colorado. Recommendations necessary to prevent future health hazards are included in the body of the full report.

PB82-258120 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HHE-80-158-902, Lincoln Medical and Mental Health Center, Bronx, New York,
Larry McLouth, and Arthur Watanabe. Jun 81, 22p HHE-80-158-902

In May 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request from an authorized representative of employees of the Lincoln Medical and Mental Health Center to evaluate the exposure of operating room personnel to waste anesthetic gases. Concern was expressed in the request about acute symptoms and the number of miscarriages observed among the personnel. Data collected during the time of this evaluation indicated that operating room personnel were being exposed to concentrations of nitrous oxide, halothane, and ethrane in excess of the NIOSH-recommended levels. Recovery room personnel reported a higher proportion of acute symptoms than operating room personnel. The small number of employees surveyed preclude a definite conclusion about waste anesthetic gas associated chronic health effects. However, based on environmental levels measured, steps should be taken to reduce exposures. Recommendations for reducing waste anesthetic gas levels are included in the body of the full report.

PB82-258278 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-099-908, AOPR, Inc., Cincinnati, Ohio,
Steven A. Lee. Jul 81, 6p HETA-81-099-908

In November 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request from the owners of AOPR, Incorporated, Cincinnati, Ohio, for an evaluation, of their office building in Cincinnati. Direct-reading colorimetric detector tubes were used to measure formaldehyde, ozone, oxides of nitrogen, sulfur dioxide, total hydrocarbons, ammonia, triethylamine, aniline, phenol, carbon monoxide, and carbon dioxide. All levels were below the limits of detection. On the basis of the data collected in this investigation, NIOSH determined that no health hazards due to air contaminants existed at the time of this survey. The cause of the symptoms remains unknown, but it was not likely due to chemicals generated by materials then in the office.

PB82-258302 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-057-905, Jefferson County Mental Health Center, Wheat Ridge, Colorado,
Bobby J. Gunter. Jun 81, 9p HETA-81-057-905

In November 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request from an employee of the Jefferson County Mental Health Center in Wheat Ridge, Colorado, to evaluate a potential health hazard to chemicals used in a printing machine at the mental health center. Examination of all cleaning and solvent materials used indicated that petroleum distillates, xylene, and toluene were the primary chemicals. Only one person was exposed for approximately 2 hours each day. Direct-reading detector tube samples showed only trace quantities (10 to 15 mg/cu M) of xylene and toluene. Three long-term air samples for petroleum distillate showed concentrations of 333 mg/cu m, 214 mg/cu m, and nondetectable. These levels are below the Occupational Safety and Health Administration (OSHA) standard of 2000 mg/cu m. Although the environmental samples collected during this survey did not demonstrate overexposures at the printing machine, employee symptoms appear to result from the operation of the printing machine. Recommendations on preventing a health hazard at this worksite are included in the body of the full report.

PB82-258450 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.

Health Hazard Evaluation Report No. HETA-81-142-892, McKeesport Hospital, McKeesport, Pennsylania,
Walter J. Chrostek. Jun 81, 14p HETA-81-142-892

On January 5, 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request from the Assistant Administrator of the McKeesport Hospital, McKeesport, Pennsylvania, for a Health Hazard Evaluation of the Histology and Cytology Laboratories in the Kelly Building and of the Gross Histology Laboratory in the Crawford Building. The request stated that the Medical Technologists, Histologists, and Cytologists were complaining of skin and eye irritation, fatique, burning sensation in the throat, gastric upsets, headaches, dizziness, and nasal congestion. The suspect agents were xylene, isopropanol, ethanol, and formaldehyde. On the basis of data obtained in this investigation, NIOSH determined that a hazard from overexposure to organic solvent vapors (ethanol, isopropanol, and xylene) did not exist in the Histology and Cytology Laboratories. However, exposures to formaldehyde gas exceeded the NIOSH criterion in the Gross Histology Laboratory. Because of recent toxicological studies, NIOSH further recommends that formaldehyde be treated as a potential carcinogen, and that exposures be reduced to their lowest feasible level. Recommendations have been incorported into the body of the full report to control exposure to formaldehyde gas in the Gross Histology Laboratory.

PB82-262601 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-168-903, Wheeling Pittsburgh Steel Corporation, Martins Ferry, Ohio,
John R. Kominsky. Jun 81, 13p HETA-81-168-903

On February 17-19, 1981, the National Institute for Occupational Safety and Health (NIOSH) conducted a Health Hazard Evaluation at Wheeling Pittsburgh Steel Corporation, Martins Ferry, Ohio, a continuous coiled steel galvanizing facility. The investigation evaluated exposures of employees on three continuous galvanizing lines to contaminants released from acid pickling tanks and zinc galvanizing kettles. On the basis of air sampling and medical interviews, NIOSH concluded that under normal operating conditions exposures to hydrochloric acid, zinc chloride, and carbon monoxide did not exist above current evaluation criteria at Wheeling Pittsburgh Steel Corporation, Martins Ferry, Ohio. However, the crane operators were experiencing occasional symptons of nose and eye irritation during the galvanizing of 16 and less gauge steels. Recommendations to control these exposures are contained in the body of the full report.

PB82-262619 PC **A02**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
Health Hazard Evaluation Report No. HETA-81-216-894, Central Bank of Academy Boulevard, Colorado Springs, Colorado,
Paul Pryor. Jun 81, 12p HETA-81-216-894

In March 1981, the National Institute for Occupational Safety and Health (NIOSH) received a request from a representative of the Central Bank of Academy Boulevard, Colorado Springs, Colorado, to evaluate exposure to carbon monoxide in teller drive-up windows at the bank. To evaluate the exposures, an industrial hygiene and medical evaluation was performed. Breathing-zone and general room air samples were taken on the workers for determination of exposures to carbon monoxide (CO). The medical evaluation consisted of a medical questionnaire and pre-shift/post-shift bloods for carboxyhemoglobin (COHb). On the basis of the environmental data, NIOSH concluded that there was no hazard to CO during the survey periods. However, a potential health hazard does exist from recommendations on ventilation, work practices, and medical surveillance procedures necessary to avoid a health hazard are included in the body of the full report.

6K. Life Support

AD-A118 650/1 PC **A03**/MF **A01**
Navy Clothing and Textile Research Facility, Natick, MA.
The Liquid-Air System and the Dry-Ice Cooling System: A Field Test of the Cooling Capabilities of Two Life-Support-Suit Assemblies.
Final rept. Aug 80-Jul 81,
Arthur H. Chadwick, James C. Shampine, Robert A. Keene, and Joseph W. Giblo. Jul 82, 34p Rept no. NCTRF-144

The Navy Clothing and Textile Research Facility (NCTRF) conducted a field evaluation to compare two life-support-suit assemblies. One assembly was a liquid-air-cooled suit that provided convective cooling; the other was a dry-ice system that used liquid-cooled underwear to provide conductive cooling. The test results indicated the dry-ice system was preferred by 74.2% of the test subjects for cooling purposes. (Author)

N82-29897/7 PC **A03**/MF **A01**
California Univ., Berkeley. Dept. of Mechanical Engineering.
An Approach to the Preliminary Evaluation of Closed Ecological Life Support System (Celss) Scenarios and Control Strategies.
J. D. Stahr, D. M. Ausiander, R. C. Spear, and G. E. Young. Jul 82, 46p NASA-CR-166368, NAS 1.26:166368
Contract NCC2-67

Life support systems for manned space missions are discussed. A scenario analysis method was proposed for the initial step of comparing possible partial or total recycle scenarios. The method is discussed in detail.

N82-29898/5 PC **A05**/MF **A01**
Life Systems, Inc., Cleveland, OH.
Preprototype Independent Air Revitalization Subsystem.
Final Report.
F. K. Schubert, Apr 82, 92p NASA-CR-167703, NAS 1.26:167703
Contract NAS9-15218

The performance and maturity of a preprototype, three-person capacity, automatically controlled and monitored, self-contained independent air revitalization subsystem were evaluated. The subsystem maintains the cabin partial pressure of oxygen at 22 kPa (3.2 psia) and that of carbon dioxide at 400 Pa (3 mm Hg) over a wide range of cabin air relative humidity conditions. Consumption of water vapor by the water vapor electrolysis module also provides partial humidity control of the cabin environment. During operation, the average carbon dioxide removal efficiency at baseline conditions remained constant throughout the test at 84%. The average electrochemical depolarized concentrator cell voltage at the end of the parametric/endurance test was 0.41 V, representing a very slowly decreasing average cell voltage. The average water vapor electrolysis cell voltage increased only at a rate of 20 mu/h from the initial level of 1.67 V to the final level of 1.69 V at conclusion of the testing.

6L. Medical and Hospital Equipment

PB82-259425 PC **A03**/MF **A01**
Food and Drug Administration, Silver Spring, MD. Bureau of Medical Devices.
Report by the Task Force on Computers and Software as Medical Devices,
C. Bruch, J. Jorgens, E. Mueller, F. Houston, and C. Reynolds. Jan 82, 33p FDA/BMD-82/100
Presented at the Annual Meeting of the Association for Advancement of Medical Instrumentation (17th), May 9-12, 1982, San Francisco, CA.

The Bureau of Medical Devices (BMD) within the Food and Drug Administration is charged with the implementing the Medical Device Amendments of 1976. All medical devices fall within the bureau's jurisdication and are regulated to the extent necessary to assure their safety and efficacy. As microprocessors, computers, and associated software increase the utility of medical devices, it became evident that BMD would need to stay abreast of this technology. A task force of Bureau personnel was created to analyze and present opinions and recommendations concerning the safety and efficacy of computer aided medical devices (CAMDs) and the software used in such medical devices.

PB82-261652 Not available NTIS
National Bureau of Standards, Washington, DC.
Copper-Free Amalgams: Dimensional Change After Approximately Five Years at 60, 37, and 23 degrees C. Dimensional Change of Copper-Free Amalgams.
Final rept.,
G. C. Paffenbarger, N. W. Rupp, and P. R. Patel. Jun 82, 3p
Sponsored in part by American Dental Association Health Foundation, Chicago, IL.
Pub. in Jnl. of Dental Research 61, n6 p811-813 Jun 82.

Two copper-free amalgams expanded excessively after storage in air at 60C for about five years. One expanded significantly at 37C and slightly at 23C. High silver content, absence of copper, and presence of small amounts of zinc, or all three, seemed to promote very high expansions at 60C.

PB82-262734 PC **A02**/MF **A01**
Jefferson Medical Coll., Philadelphia, PA.
Assessment of Ultrsonic B-Scan Imaging for Detection and Quantification of Atherosclerotic Lesions in Human Carotid and Iliofemoral Arteries and in Arteries of Animals.
Annual rept. Apr 81-Apr 82,
Barry B. Goldberg. 28 May 82,18p NIH-N01-HV-2912
Contract N01-HV-2912

Every effort has been expended toward the complete organization of the research project, 'Ultrasound B-Scan Imaging Assessment Program', so that all facilities will be in complete coordination with one another, both interfacility and intrafacility. Thirty-two patients were enrolled in a pilot program. This enabled the staff to become familiar with the procedures required in all aspects of the protocol and to make modifications of the protocol where deemed necessary. All completed forms of the protocol were then forwarded to the Research Triangle Institute for statistical analysis. A formal program of assessing the efficacy and reliability of B-Scan Ultrasound in identifying, measuring and comparing atherosclerotic plaques of the iliofermoral and carotid arteries with recent arteriography, surgery and pathology along with appropriate functional studies will begin in the very near future.

PB82-265422 PC **A04**/MF **A01**
Pennsylvania Univ., Philadelphia.
National Conference Monograph: Evaluating the Performance of Maiti-Institutional Systems, May 14-16, 1981. Executive Summary.
Final rept. 15 Mar 81-15 Sep 81,
William P. Pierskalla, and Joanne Levy. 1982, 70p
NCHSR-82-67
Grant PHS-HS-04524

The conference reached very general recommendations on evaluating the performance of multi-institutional systems: The precise definition of performance remained elusive, probably due to inadequate consideration of system aims and philosophy. Participants encountered difficulty on methodology and design of evaluation measures, and on levels of evaluation. Data collection methods tend to produce inaccurate or misleading data which becomes useless to interpret. Time-series comparative case studies of multi-institutional systems, before and after mergers in relation to free-standing hospitals are important means to better understand what actually happens when multi-institutional systems are formed.

PB82-811449 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computerized Axial Tomography. 1964-May, 1982 (Citations from the NTIS Data Base) (RE-ANNOUNCEMENT of PB82-808353 - see notes field for explanation).
Aug 82, 239p
RE-ANNOUNCEMENT of PB82-808353 with a new abstract. Supersedes PB81-804528, and PB80-805229.

The bibliography is a compilation of Federally-funded research citations on the following topics on computerized axial tomography technology: Criteria and standards for need assessment; guidelines for services planning; cost-benefit analysis; equipment and oper-

ation; and impact on medical diagnosis. (This updated bibliography contains 232 citations, 41 of which are new entries to the previous edition.)

PB82-875535 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Prosthetic Devices Bioengineering. 1973-September, 1982 (Citations from Information Services in Mechanical Engineering Data Base).
Rept. for 1973-Sep 82.
Sep 82, 77p
Supersedes PB81-881880.Prepared in cooperation with Cambridge Scientific Abstracts, Washington, DC.

This bibliography contains citations concerning the mechanical engineering of various prosthetic devices. Studies are included which examine such design concepts as joint friction, lubrication, ease of insertion, fixation, wear, fatigue and adjustment capabilities and requirements. Engineering evaluations are considered for such prosthetic applications as knee joints, arms, fingers, hip joints, shoulders, femors, heart valves, visual devices, and spines. (This updated bibliography contains 91 citations, 11 of which are new entries to the previous edition.)

PB82-875600 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plastics and Elastomers: Dental Applications. 1973-September, 1982 (Citations from the Rubber and Plastics Research Association Data Base).
Rept. for 1973-Sep 82.
Sep 82, 108p
Supersedes PB81-867673.

This bibliography contains citations concerning the state of the art of polymeric dental materials. Developments, innovations, and testing of such restorative dental polymers as acrylics, polyether sulphones, silicones, polysulfides, and PMMA are included. Performance evaluations relative to impact properties, fatigue, hardness, abrasion resistance, fracture toughness, water absorption, bend strength, and dimensional stability are presented. (This updated bibliography contains 115 citations, 65 of which are new entries to the previous edition.)

6M. Microbiology:

AD-A118 655/0 Not available NTIS
Pennsylvania State Univ., University Park. Dept. of Microbiology.
Ensifer adhaerens gen. nov., sp. nov.: A Bacterial Predator of Bacteria in Soil,
L. E. Casida, Jr. 1982, 8p ARO-16113.7-LS
Grant DAAG29-79-G-0043
Availability: Pub. in International Jnl. of Systematic Bacteriology, v32 n3 p339-345 Jul 82 (No copies furnished by DTIC/NTIS).

No abstract available.

DE82014608 PC **A02**/MF **A01**
Georgia Univ., Athens. Dept. of Microbiology.
Microbial Desulfurization and Denitrogenation of Fossil Fuels. Progress Report, August 1, 1981-July 31, 1982.
W. R. Finnerty. Apr 82, 9p DOE/ER/10683-3
Contract AS09-80ER10683

The presence of plasmids and their involvement in dibenzothiophene oxidation was determined for DBT-2, DBT-3, and DBT-4. The major physiological characteristics of the dibenzothiophene-oxidizing bacteria are summarized. Carbazole-utilizing microorganisms were isolated by conventional enrichment procedures in pure culture and designated as C-1, C-2, C-3, and C-4. These isolates were able to grow at the expense of carbazole as the sole source of carbon, energy and nitrogen. The ability of C-4 to utilize alternative nitrogen-containing compounds as the sole source of carbon and energy or nitrogen was determined. The carbazole-utilizing isolates were screened for the presence of plasmids. Preliminary curing studies indicate the loss of plasmid DNA results in the loss of ability of these isolates to grow on carbazole. The ability of C-4 to grow at the expense of various crude oils was evaluated with and without carbazole supplementation. The major physiological characteristics of the carbazole-utilizing bacteria are listed. Research into the ring cleaving enzyme systems have been developed during this funding period. All DBT-oxidizing isolates are induced for ortho and meta ring cleaving enzymes when grown under appropriate conditions for dibenzothiophene oxidation. We have attmepted to define the pathway involved in the partial oxidation of dibenzothiophene by these isolates. Studies into the genetics of DBT oxidation by our isolates have progressed extremely well. We have isolated the plasmids from DBT-2 and DBT-4 for physical characterization.

DE82015394 PC **A05**/MF **A01**
Science Applications, Inc., McLean, VA.
Application of ATP Measurements to the Microbiological Evaluation of a Petroleum Reservoir.
P. M. Jones. Jun 81, 84p DOE/BC/10301-11
Contract AC19-80BC10301
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The objective of the work reported in this document was to determine whether the bioluminescent luciferin/luciferase based adenosine triphosphate (ATP) assay could be used as a rapid field tests for determining the presence and numbers of microorganisms in oil field fluids. The ATP-photometric technique employed is based on the ATP-mediated bioluminescent oxidation of firefly luciferin. Light production is stoichiometrically related to ATP concentration; ATP concentration is related to numbers of living organisms present in a sample. Samples used in this study comprised reservoir fluids collected from several Southern California oilfields. Based on experimental evidence, it was concluded that the ATP assay could be profitably applied to Microbially Enhanced Oil Recovery (MEOR) process monitoring and control. The theoretical basis for the assay, field-usage methodologies, and fundamentals of data interpretation are presented to make the document usable as a field manual.

6O. Pharmacology

AD-A118 795/4 PC **A03**/MF **A01**
Air Force Aerospace Medical Research Lab., Wright-Patterson AFB, OH.
Recent Advances in Methodology and Concepts for Characterizing Inhalation Pharmacokinetic Parameters in Animals and Man.
Journal article,
Melvin E. Andersen. 1982, 29p Rept no. AFAMRL-TR-81-52
Pub. in Drug Metabolism Reviews, v13 n5 p799-826 1982.

No abstract available.

AD-A118 812/7 PC **A02**/MF **A01**
Columbia Univ., New York. Coll. of Physicians and Surgeons.
Pharmacological Studies on Clostridial Neurotoxins.
Annual rept. 1 Nov 81-31 Aug 82,
Lance L. Simpson. Aug 82, 25p Rept no. 1
Contract DAMD17-82-C-2005

Experiments have been done that compare the actions of botulinum toxin type A, tetanus toxin, diphtheria toxin and beta-bungarotoxin on the cholinergic neuromuscular junction. All four toxins bind to tissues without producing adverse effects; each of the toxins has its own unique class of receptors. After tissue binding has occurred, botulinum toxin, tetanus toxin and diphtheria toxin are internalized; this process is antagonized by chloroquine, ammonium chloride and methylamine hydrochloride. Beta-Bungarotoxin is not internalized and is not antagonized by the drugs just listed. Diphtheria toxin acts intracellularly to ADP-ribosylate elongation factor 2. The intracellular actions of botulinum toxin and tetanus toxin have not been determined.

PB82-253303 CP **T02**
Food and Drug Administration, Rockville, MD. Bureau of Drugs.
Approved Prescription Drug Products with Therapeutic Equivalence Evaluations.
Data file,
James P. Hannan, and Delores D. Willis. Jul 82, mag tape FDA/DF-82/003
Supersedes PB82-129164.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

This data file was created to allow computer processing of data from the Approved Prescription Drug Products with Therapeutic Equivalence Evaluations (APDP). Each record contains the information required to identify a particular drug product. Other information regarding conventions and use of the data is contained in the preface to the APDP. To facilitate processing, there is some duplication of information among records so that each record contains all identifying information. In addition, for each record one NDA or ANDA number is included although more than one may apply to the particular drug product identified. The possibility of multiple numbers exists because the applicant may have more than one NDA or ANDA approved for the same drug product within the context of the data in the APDP. The distinguishing information may be package size, excipients, distributors, etc.

PB82-265257 PC **A03**/MF **A01**
Washington Univ., Seattle.
Experimental Evaluation of Computerized Drug Profiles. Executive Summary and Final Report.
Rept. for 30 Sep 79-31 Dec 81,
Richard K. Tompkins, and Thomas D. Koepsell.
1982, 45p NCHSR-82-68
Grant PHS-HS-03892

This study assesses the benefits of computerized drug profiles in terms of improved prescribing practices and savings in provider and patient time, and the costs in terms of system operating expenses and changes in drug expenditure and utilization patterns. Baseline data were collected for five months prior to the routine computer generation of a detailed drug profile for an 80% random sample of the clinic population. Identical drug information was captured for the remaining 20% of patients, but no profiles were generated. Analysis included comparisons within and between the control and experimental groups both before and after implementation, and between group comparisons for any changes occurring within each group during the study.

PB82-923006 PC**$6.50**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Interferon: Preclinical Studies of Antiviral Activity.
Oncology overview.
Sep 82, 111p NCI/ICRDB/OB-82/06

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Mechanisms of antiviral action of interferons; Sensitivity/resistance studies of interferons' antiviral activity; Preclinical studies of interferons' antiviral efficacy; General reviews on interferons' antiviral activity.

PB82-923008 PC**$6.00**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Mechanisms of Resistance to Methotrexate and Other Folate Antagonists.
Oncology overview.
Sep 82, 77p NCI/ICRDB/OB-82/08

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Intrin-

sic resistance to methotrexate and other folate antagonists; Acquired resistance to folate antagonists; Collateral sensitivity between methotrexate and other agents; Overcoming resistance to folate antagonists; Other studies related to resistance to folate antagonists; Reviews and general literature on mechanisms of resistance to folate antagonists.

6P. Physiology

DE82009834 PC **A02**/MF **A01**
North Carolina Univ. at Chapel Hill. Dept. of Surgery.
Study of the Influence of Hormones on the Transport of Cations into and out of Bone. Final Report.
R. V. Talmage. 1 Apr 82, 18p DOE/EV/04106-T1
Contract AS05-76EV04106

This final report of a 10-year study to determine the influence of certain hormones on the membrane transport of cations into and out of bone reviews the results and offers the principal investigator's suggestions for future efforts. (ERA citation 07:044796)

PB82-875337 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Rheology of Blood. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 93p
Supersedes PB80-851355.

This bibliography contains citations concerning the principles and application of blood rheology. Hemodynamics of blood cells, cell walls, and the measurement of flow are considered. Mathematical modelling is included. (This updated bibliography contains 86 citations, 21 of which are new entries to the previous edition.)

PB82-923004 PC**$6.00**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Endogenous Polypeptide Growth Factors.
Oncology overview.
Sep 82, 78p NCI/ICRDB/OB-82/04

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Epidermal growth factor (EGF); Nerve growth factor (NGF); Fibroblast growth factor; Platelet-derived growth factor; Other growth factors.

6Q. Protective Equipment

AD-A118 643/6 PC **A03**/MF **A01**
Navy Clothing and Textile Research Facility, Natick, MA.
The Fitting Characteristics of Safety Boots on Military Women.
Final rept.,
Milton Bailey. Jun 82, 33p Rept no. NCTRF-140

The Navy Clothing and Textile Research Facility (NCTRF) tested the fitting characteristics of men's safety boots carried in the Supply System on a representative sample of Navy women and concluded that more than 95% of military females can be fitted with footwear selected from sizes 4 to 10 in whole and half sizes, in widths extra narrow (XN), narrow (N), regular (R), wide (W), and extra wide (XW). The tariff will require sizes 2 and 3 in widths XN, N, R, and W to accommodate the remaining 'no fit' females of the population. The data also facilitated the development of a size guide for converting female shoe sizes to men's safety shoe sizes. The use of the size guide is recommended for fitting and requisitioning men's safety shoes for women, and the safety footwear for the military supply system is recommended for issue to military women. (Author)

6R. Radiobiology

AD-A118 821/8 PC **A02**/MF **A01**
Naval Aerospace Medical Research Lab., Pensacola, FL.
Microwave-Induced Developmental Defects in the Common Mealworm (Tenebrio molitor). A Decade of Research.
Final rept.,
Richard G. Olsen. 9 Dec 81, 15p Rept no. NAMRL-1283

Microwave-induced developmental effects in insects have been studied at several laboratories during the past decade. Results of the initial experiments were interpreted to show a 'nonthermal' microwave effect, but as more studies were conducted by various investigators, a predominantly thermal effect appeared to be the best explanation. This report presents the results of a comprehensive series of insect irradiation experiments including a rigorous statistical analysis of the data. Statistical analysis shows no microwave-induced effects for exposure of up to 4 hours at dose rates of 63 watts/kilogram. Irradiation at higher intensities (102-126 W/kg) did produce statistically significant effects when applied over a 2-4 hour period. (Author)

DE82903030 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.
Optimization of Radioprotection Organization in Nuclear Power Plants.
M. De Blasiis, C. Papa, and S. Paribelli. Nov 80, 63p CNEN-RT/PROT-(80)24
In Italian.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This paper deals with dates on radioprotection organization in nuclear power plants pointing out some significant parameters for its optimization. (ERA citation 07:044792)

NUREG/CR-1895 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
An Investigation of the Degree of Equilibrium of the Long-Lived Uranium-238 Decay Chain Members in Airborne and Bulk Uranium Ore Dusts.
Rept. for Jun 76-Dec 80,
P. O. Jackson, and C. W. Thomas. Aug 82, 59p PNL-3696

The degree of disequilibrium among 238U decay chain members in some airborne dusts and typical ores has been established by precise radiochemical analyses. This information is necessary to evaluate the lung dose model currently used for estimating the effect of the inhalation of uranium ore dust. The particle size distributions of airborne decay chain components in dusts at one uranium mill have been investigated. Statistically significant disequilibria were observed for 230Th, 226Ra, and 210Pb in both airborne dusts and composite ore samples. With the exception of ore from one mill in the United States, most of the daughter concentrations in powdered ore composites were within 10% of 238U. In airborne dusts, the concentration of 226Ra was typically below 238U; the minimum 226Ra concentration observed for airborne ore dusts was 56% of equilibrium. A statistically significant particle size dependence was observed for 226Ra/238U ratios in several airborne dusts collected at a uranium mill.

6S. Stress Physiology

AD-A118 618/8 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Thermal Comfort in an Era of Energy Shortage,
Ralph F. Goldman. 1982, 17p Rept no. USARIEM-M-30/80
Pub. in American Society for Testing and Materials, p84-98 1982. Supersedes AD-A093 193.

No abstract available.

AD-A118 638/6 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Effects of Training with Eccentric Muscle Contractions on Exercise Performance, Energy Expenditure, and Body Temperature,
Howard G. Knuttgen, Ethan R. Nadel, Kent B. Pandolf, and John F. Patton. 1981, 8p Rept no. USARIEM-M-11/81
Pub. in International Jnl. of Sports Medicine, v3 n1 p13-17 Jan 82.

No abstract available.

AD-A118 659/2 PC **A04**/MF **A01**
Pennsylvania State Univ., University Park. Biomechanics Lab.
Effects of Gender and Load on Combative Movement Performance. Volume I.
Final rept. 1 Oct 79-31 Aug 81,
Richard C. Nelson, and Philip E. Martin. Feb 82, 69p NATICK-TR-82/011-VOL-1, NATICK/IPL-237-VOL-1
Contract DAAK60-79-C-0131

This study was conducted to determine the effects of loads worn or carried by men and women on their movement capabilities. Fourteen women and sixteen men performed seven tests under each of the following load conditions: Load 1- baseline (shorts, t-shirt, sneakers); Load 2- fighting gear (utility shirt and trousers, boots, ALICE fighting gear); Load 3- combat gear (Load 2 plus PASGT helmet, PASGT armor vest, simulated M16 rifle); Load 4- combat gear and 20-lb backpack load (Load 3 plus ALICE LC-2 frame and ALICE pack with 20-lb load); Load 5- combat gear and 35-lb backpack load (Load 4 plus an additional 15-lb in backpack); Load 6-combat gear and 50-lb backpack load (Load 4 plus an additional 30-lb in backpack). The seven performance tests consisted of 10- and 25-yard sprints, an agility run, a standing long jump, reaction movements to the left and right, and a ladder climb. Statistical analyses were also performed to determine the relationship of task performance to body height, weight, and percent body fat, as well as the day-to-day and trial-to-trial reliability of each performance measure. Further analyses were included on the relationships of load condition and task performance to body weight and lean body weight.

AD-A118 669/1 PC **A03**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Hypohydration and Exercise: Effects of Gender, Environment and Heat Acclimation,
Michael N. Sawka, Michael M. Toner, Ralph P. Francesconi, and Kent B. Pandolf. 19 Jul 82, 33p Rept no. USARIEM-M-38/82

The purpose of this study was to examine the effects of heat acclimation and subject gender on treadmill exercise in a comfortable(20 C, 40% rh), a hot-dry (49 C, 20% rh) and a hot-wet (35 C, 79% rh) environment while subjects were hypo- or euhydrated. Six male and six female subjects, matched for maximal aerobic power and percent body fat, attempted two exercise tests in environment both before and after a 10-day heat acclimation program. One exercise tests was attempted when euhydrated and the other test when hypohydrated (-5.0% from baseline body weight). In general, no significant ($P > 0.05$) differences were noted between men and women at the completion of exercise for rectal temperature (Tre), mean skin temperature (Tsk) or heart rate (HR) during any of the experimental conditions. Hypohydration was generally found to increase Tre and HR responses as well as to decrease sweat rate values while not altering Tsk responses. In the hypohydration experiments, heat acclimation significanlty reduced Tre (0.19 C) and HR (13 b min) responses in the comfortable environments, but reduced only HR responses in the hot-dry 21 b min) and hot-wet (21 b min) environments. The percent findings indicate that men and women respond in a physiologically similar manner to hypohydration during exercise. It is also suggested that an expanded plasma

volume, mediated by heat acclimation, may have attenuated Tre and HR responses during hypohydration.

AD-A118 746/7 PC **A02**/MF **A01**
New Mexico Univ., Albuquerque. Dept. of Biology.
Oral Glycerol Solutions as a Deterrent to Dehydration during Heat Exposure.
Final rept.,
Marvin L. Riedesel. 1982, 13p AFOSR-TR-82-0664
Grant AFOSR-81-0068

Heat acclimated rats gavaged with 5% glycerol solutions equivalent to 4% initial body weight excreted less urine during a 3-h heat exposure than did rats gavaged with the same volume of water. C-glycerol studies describe rapid absorption and distribution of glycerol among body tissues. (Author)

AD-A118 747/5 PC **A02**/MF **A01**
Army Research Inst. of Environmental Medicine, Natick, MA.
Evaluation of a Maximal Predictive Cycle Ergometer Test of Aerobic Power,
J. F. Patton, J. A. Vogel, and R. P. Mello. 20 Jan 82, 12p Rept no. USARIEM-M-6/81
Pub. in European Jnl. of Applied Physiology, v49 p131-140 1982. Supersedes AD-A111 034.

No abstract available.

PB82-876335 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Noise-Induced Hearing Loss. 1972-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 119p
Supersedes PB81-874323.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning environment- related acoustic trauma. Primary consideration is given to flight personnel, both military and nonmilitary. The sources of noise stress and related factors as sound level, sound frequency, and exposure time are considered. The pathology, diagnosis, therapy, and prevention are discussed. (This updated bibliography contains 124 citations, 12 of which are new entries to the previous edition.)

6T. Toxicology

AD-A118 560/2 PC **A02**/MF **A01**
District of Columbia Univ., Washington. Dept. of Biology.
A Neurobehavioral Study of Rats Using a Model Perfluorinated Acid, NDFDA.
Final rept.,
Inez R. Bacon. 13 Jul 82, 20p AFOSR-TR-82-0634
Grant AFOSR-81-0136

Fischer 344 rats were treated with 10,20, or 30 mg/kg of nonadecafluorodecanoic acid (NDFDA) on day 12 of gestation. Negative controls were given the vehicle (propylene glycol and water; 50:50) and positive controls were given a single ip injection of 500 mg/kg hydroxyurea (diluent, physiological saline). Developmental eruption, eye opening, and growth) and behavior, NDFDA was found to produce increased visuomotor development (visual placing). It is also caused decreased prenatal and postnatal weight gain, delayed cliff avoidance and surface righting, decreased open field rearing, aberrant swimming development and increased auditory startle. The observed effects indicate that NDFDA is a potential toxic neurochemical teratogen. (Author)

AD-A118 642/8 PC **A02**/MF **A01**
Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD.
Dermal Hazard Evaluation of Diethyl Chloroethyl Amine Underwear Fabric Treatment.
Interim rept. Apr 79-Jun 82,
Richard A. Angerhofer, and Michael J. Topper. 24 Aug 82, 6p Rept no. USAEHA-75-51-0218-82

To provide guidance for further skin testing, diethyl chloroethyl amine -- treated cotton underwear fabric was applied in patch form to the intact and abraded skin of New Zealand White rabbits. Treated cotton fabrics OD III DS 0.144 and White DS 0.079 did not cause primary skin irritation in rabbits under controlled test conditions. It was recommended that cotton fabrics reacted with diethyl chloroethyl amine to a degree of substitution (DS) of less than 0.145 mole of amine substitute/mole of cellulose monomer unit be approved for further skin testing, including prophetic human patch testing. (Author)

AD-A118 697/2 PC **A02**/MF **A01**
Northrop Services, Inc., Research Triangle Park, NC.
Estimated Toxicity of Neutralized Salts with and without Trace Amounts of Agent GB.
Final rept.,
Charles J. Alden, H. Frank Stack, and Neil E. Garrett. 25 Jun 82, 24p
Contract DAAG29-81-D-0100

This report recommends that the limit for allowable GB (Isopropyl Methylphosphonofluoridate) content in the neutralization brine be raised from 2ppb to 1ppm to permit more rapid processing of munitions and to facilitate the analytical procedure for monitoring brine. The level of 1ppm would not increase the overall toxicity of the dried salts by more than 1 percent. The presence of NaF and NaOH in the salts is more harmful than the raised GB level. (Author)

DE82014390 PC **A06**/MF **A01**
Lovelace Biomedical and Environmental Research Inst., Albuquerque, NM. Inhalation Toxicology Research Inst.
Potential Health and Environmental Effects of Light Duty Diesel Vehicles. II.
R. G. Cuddihy, W. C. Griffith, C. R. Clark, and R. O. McClellan. Oct 81, 107p LMF-89
Contract AC04-76EV01013

Information is presented on the following subjects: occupational risks in the diesel reference industries; characteristics of light duty diesel vehicle emissions; potential environmental impacts of future light duty diesel vehicles; exposures of people to diesel exhaust emissions; models for evaluating health risks to people from exposures to diesel vehicle exhaust; projected health risks from future use of light duty diesel vehicles; and, research needs. Three appendixes are included. Results of computer simulation studies indicated that if diesel engines were used in 20% of future light duty vehicles, little change would be expected in urban air concentrations of vapor phase hydrocarbons, nitrogen oxides, nitric and nitrous acid, ozone, hydrogen perioxide, and carbon monoxide. Several methods were developed to estimate cancer risk in people exposed to diesel exhaust particles. Results of two of the methods indicated that there would be 0.1 and 0.15 cancers per 100,000 people per mu g/m exp 3 average lifetime exposure to diesel particles. (ERA citation 07:044649)

DE82014575 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Effects of Orocol TL (a Corrosion Inhibitor) on Germination and Growth of Bush Beans.
P. D. Parr. Apr 82, 67p ORNL/TM-7838
Contract W-7405-ENG-26
Thesis. Submitted to Univ. of Tennessee, Knoxville.

As part of a continuing series of studies conducted to determine the environmental effects of hexavalent chromium from cooling tower drift on biological systems, the potential for germination and growth effects in bush beans (Phaseolus vulgaris L. var Bush Blue Lake) from hexavelent chromium in Orocol TL (a proprietary chromated, zinc-phosphate compound added to DOE cooling water systems for corrosion inhibition) was investigated at low and high concentrations in the soil by adjusting soil pH and the percent of organic matter. Germination effects were determined in bean plants grown in soils adjusted to differing pH range (4-4.5, 5-5.5, 6.5-7), levels of organic matter (1.8%, 3%, 5%) and Orocol TL amendments (control of 0 mu g/g, 10 mu g/g chromium). Growth responses (effects) were determined from bush bean plants cultured in the same soil treatment combinations as described for the germination study. Plants were harvested when the plant died or at the end of eight weeks and partitioned into leaves, stems and roots. Following weight determinations, the leaves, stems and roots were analyzed for total chromium content, and the results compared using analysis of variance and multiple comparison procedures. High levels (500 mu g/g) of hexavalent chromium in soil (as Orocol TL) affected germination and growth, while a high level of organic matter significantly reduced chromium toxicity on germination. At lower chromium concentrations there was significant uptake by all plant parts, with a corresponding reduction in biomass of leaves. Consequently, adjustments of soil pH from 4.0 to 7.0 appear to have no significant effect on chromium uptake in plants. Increasing the organic matter level to 5%, while decreasing the toxicity of high chromium levels to germinating seed, did not affect chromium uptake. (ERA citation 07:044839)

PB82-258393 PC **A08**/MF **A01**
National Toxicology Program, Research Triangle Park, NC.
Carcinogenesis Bioassay of Vinylidene Chloride (CAS No. 75-35-4) in F344/N Rats and B6C3F1/N Mice (Gavage Study).
May 82, 167p NIH/PUB-82-1784, NTP-80-82

A subchronic and a chronic carcinogenesis study of vinylidene chloride (99% pure), a widely used chemical intermediate and monomer, were conducted in F344/N rats and B6C3F1/N mice. In subchronic studies, groups of 10 rats and 10 mice of either sex were administered vinylidene chloride in corn oil by gavage five times per week at 0, 5, 15, 40, 100, or 250 mg/kg body weight for 13 weeks. At the end of this study, representative tissues from these animals were subjected to histopathological examination. The liver was identified as a target organ for vinylidene chloride toxicity. Under the conditions of this bioassay, vinylidene chloride administered by gavage was not carcinogenic for F344/N rats or B6C3F1/N mice of either sex. However, since the use of a maximum tolerated dose in this study has not been clearly demonstrated and since previously reported studies have shown that carcinogenicity is associated with inhalation exposure to vinylidene chloride, this study should not be taken as proof that the chemical is not a carcinogen.

PB82-258880 PC **A02**/MF **A01**
Health Effects Research Lab., Research Triangle Park, NC.
The Effect of Controlled Ozone Exposure on Human Lumphocyte Function.
Journal article,
Mirdza L. Peterson, Ralph Smialowicz, Shirley Harder, Brock Ketcham, and Dennis House. Jan 82, 12p EPA-600/J-81-508
Pub. in Environmental Research 24, p299-308 1981.

The effects of ozone (03) on cell-mediated immunity were studied in 16 human subjects exposed to 1176 micrograms/cu.m. 03 (0.6 ppm) for 2 hr in an environmentally controlled exposure chamber. Venous blood smaples were taken before and immediately after controlled air and 03 exposures, as well as at 72 hr, 2 and 4 weeks, and at one random time at least 1 month after treatment. The relative frequency of T lymphocytes in blood and the in vitro blastogenic response of lymphocytes to phytohemagglutinin (PHA), concanavalin A (Con A), pokeweed mitogen (PWM), and Candida albicans were determined.

PB82-261389 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
The Effects of Diflubenzuron on a Complex Laboratory Stream Community.
Journal article,
Stephen R. Hansen, and Ronald R. Garton. 4 Feb 81, 12p EPA-600/J-82-217
Pub. in Archivies of Environmental Contamination and Toxicology 11, p1-10 1982,

Effects were assessed on the total biological community in complex laboratory streams caused by continuous exposure to diflubenzuron (1-(4-chlorophenyl)-3-(2,6-difluorobenzoyl) urea).

PB82-261397 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Evaluation of a 'Daphnia magna' Renewal Life-Cycle Test Method with silver and endosulfan.
Journal article,
A. V Nebeker. Jul 81, 7p EPA-600/J-82-220
Pub. in Water Research, v16 p739-744 1982.

Four contract and two U.S. Environmental Protection Agency laboratories participated in round-robin tests using Daphnia magna as the test animals. The purpose was to determine if methods set forth in the 'Proposed Standard Practice for Conducting Renewal Life Cycle Tests with Daphnids' (ASTM Drafts 2 and 4 with modification) are adequate for routine laboratory test-

ing. Silver and endosulfan were the toxicants used. The 48-hacute test used for determining EC50 values and estimating initial concentrations for the chronic test has been used for many years with good results, and this round robin confirmed its value.

PB82-262056 PC **A05**/MF **A01**
Illinois Univ. at the Medical Center, Chicago. School of Public Health.
Health Effects of SO2 and Sulfates.
Final rept.,
Betram W. Carnow, and Edward Bouchard. Oct 79, 91p ILLDOE-79/28

This study deals primarily with the known health effects of sulfur dioxide and sulfates. The work began originally with the request of the Illinois Inst. of Natural Resources (IINR) to answer the health aspect questions relating to the costs versus the benefits of SO2 abatement. More specifically the question is: What is the possible health impact of using high sulfur Illinois coal as an energy source in Illinois.

PB82-262940 PC **A03**/MF **A01**
CONCAWE, The Hague (Netherlands).
Health Aspects of Bitumens,
P. E. Bright, E. H. Chipperfield, A. R. Eyres, E. Frati, and D. Hoehr. c1982, 46p CONCAWE-7/82

The report provides an extensive review of health aspects in the handling and use of bitumen and bitumen derivatives, with the main emphasis on indicating potential health hazards and the precautions required to avoid them. Attention is drawn to the importance of distinguishing between bitumens and coaltar products, the latter not being covered in the report. An assessment of toxicity of bitumens based on a review of published toxicological information is included as an Appendix. Main conclusions and recommendations are that: the major hazard is of skin burns; there is no evidence, from animal tests or human experience, of long-term effects in man during normal use of bitumens; precautions are required to avoid possible high exposure to fumes in confined situations, and there is a need for bitumen suppliers to advise on safe use of their products, particularly where any additional hazards may arise from the nature of the product or its application.

PB82-263112 PC **A06**/MF **A01**
Veterans Administration, Washington, DC.
Advisory Committee on Health-Related Effects of Herbicides: Transcript of Proceedings, Tenth Meeting, November 19, 1981.
Apr 82, 120p VA/82-6006

These proceedings include updates of discussions on the herbicide Agent Orange and the scientific experiments and social programs being conducted to determine its possible effects on Vietnam veterans. Reports are presented on the VA Epidemiological Study; the Ranch Hand Study; the EPA Exposure Monitoring Program; the 1981 and 1982 International Dioxin Symposia; the AFIP Agent Orange Registry; ACTION, the Vietnam veterans leadership program, and the VA Mortality Study. Comments and discussion of issues by those present conclude the report.

PB82-263120 PC **A06**/MF **A01**
Veterans Administration, Washington, DC.
Advisory Committee on Health-Related Effects of Herbicides: Transcript of Proceedings, Eleventh Meeting, February 25, 1982.
May 82, 110p VA/82-6005

These proceedings include discussion of the herbicide Agent Orange and the scientific experiments and social programs being conducted to determine its possible effects on Vietnam veterans. Reports are presented on VA Agent Orange Registry, the VA Mortality Study, activities of the Armed Forces Epidemiological Board, initiatives in the State of Wisconsin, and reports submitted by veterans' service organizations. Concluding the transcript are comments and discussion from those Committee members present.

PB82-263252 PC **A05**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Pesticides and Toxic Substances.
Trifluralin (TREFLAN (Trade Name)), alpha,alpha,alpha-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine.
Position document 4.
Jul 82, 97p EPA-540/9-82-011

Contents:
Elanco's chronic feeding study;
Revised exposure estimate;
Revised cancer risk estimate;
Ecological effects;
Comments relating to risk;
Comments relating to benefits;
Comments relating to testing requirements/ regulatory options.

PB82-263732 PC **A07**/MF **A01**
Midwest Research Inst., Kansas City, MO.
Hydrogen Sulfide Health Effects.
Final rept.,
Bonnie L. Carson, Cecily M. Beall, Harry V. Ellis, III, Larry H. Baker, and Joy L. McCann. 15 Sep 81, 138p 4997-T(4), EPA-460/3-81-028
Contract EPA-68-03-2928

Health effects literature primarily related to inhalation exposures to hydrogen sulfide was collected, evaluated, tabulated, and summarized. Approximately 350 documents were collected from computerized and manual literature searches covering the period 1887-1981. Pharmacologists and an M.D. epidemiologist rated the documents according to their applicability to the study and their methodology. The 40 documents considered useful for deriving a range of concern for human exposure to hydrogen sulfide from automotive emissions were tabulated. The 60 pages of tables detail the results of acute, repeated dose, and chronic testing of canaries, mice, rats, guinea pigs, chickens, rabbits, cats, monkeys, dogs, pigs, goats, cows, and humans as well as human occupational studies. Most of the documents evaluated are described in an annotated bibliography.

PB82-875329 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Toxicity of Tin. June, 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 83p
Supersedes PB80-851520.

This bibliography contains citations concerning the toxicity of tin as it relates to industrial hazardous waste practices. Health hazard evaluations, including maternal-fetal tissue levels, are discussed. Waste generation and the metals mining industry and their contributions to tin pollution are considered. NIOSH analytical methods are included. (This updated bibliography contains 50 citations, 19 of which are new entries to the previous edition.)

PB82-875345 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Toxicity of Beryllium. June, 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for Jun 76-Sep 82.
Sep 82, 113p
Supersedes PB80-851272.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the health hazards, actual and potential carcinogenicity, and other toxic and adverse effects of beryllium on humans, animals, and plants. The detection, characterization, and removal of beryllium in both aquatic and atmospheric systems are discussed. In addition, the detection and removal of beryllium in gas combustion effluent gas and extraction/processing plants are considered. (This updated bibliography contains 88 citations, 43 of which are new entries to the previous edition.)

PB82-876426 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Toxicity of Cobalt. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 108p
Supersedes PB82-855404.

This bibliography contains citations concerning the toxicity, carcinogenicity, environmental pollution, and other adverse effects of cobalt. The detection, analytical methods, and standards are considered, and methods of removal from the environment are discussed. The effects on aquatic and terrestrial flora and fauna, including humans, are considered. (This updated bibliography contains 66 citations, 17 of which are new entries to the previous edition.)

PB82-922903 PC**$5.25**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
DDT and Its Metabolites in Carcinogenesis.
Oncology overview.
Sep 82, 63p NCI/ICRDB/OK-82/03

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Experimental carcinogenicity studies with DDT; Experimental studies on the metabolic and toxicologic effects of DDT; Effects of DDT in vitro systems; Microsomal enzyme induction by DDT; Experimental studies of the metabolism and distribution of DDT; Epidemiological reports on the effects of exposure to DDT; Environmental occurrence, public health issues and regulations concerning DDT; Reviews of DDT and its metabolites in carcinogenesis.

PB82-922904 PC**$5.25**/MF**$3.00**
National Cancer Inst., Bethesda, MD. International Cancer Research Data Bank.
Polychlorinated Biphenyls and Polybrominated Biphenyls in Carcinogenesis.
Oncology overview.
Sep 82, 73p NCI/ICRDB/OK-82/04

Oncology Overviews are a service of the International Cancer Research Data Bank (ICRDB) Program of the National Cancer Institute, intended to facilitate and promote the exchange of information between cancer scientists by keeping them aware of literature related to their research being published by other laboratories throughout the world. Each Oncology Overview represents a survey of the literature associated with a selected area of cancer research. It contains abstracts of articles which have been selected and organized by researchers associated with the field. Contents: Experimental studies of PCBS and PBBS as carcinogens or Teratogens; Experimental studies of PCBS and PBBS as modifiers of tumorigenesis; Experimental studies of the toxicologic effects of PCBS and PBBS; Experimental studies of the metabolism and excretion of PCBS and PBBS; Experimental studies of microsomal enzyme induction by PCBS and PBBS; Epidemiological reports of exposure to PCBS and PBBS; Public health issues and regulations concerning PCBS and PBBS; Reviews of the role of PCBS and PBBS in carcinogenesis.

7. CHEMISTRY

7A. Chemical Engineering

DE82008028 MF **A01**
Amoco Research Center, Naperville, IL. Research and Development Dept.
Study of Ebullated-Bed Fluid Dynamics for H-Coal. Quarterly Progress Report No. 4, April 1, 1981-June 30, 1981.
R. J. Schaefer, and D. N. Rundell. Jul 81, 68p DOE/PC/30026-4
Contract AC22-80PC30026
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Battelle Institute completed characterization of fifteen slurry mix tank samples and issued the final technical progress report. Cold flow measurements were initiated to study the fluid dynamics of coal char/kerosene slurries fluidizing a bed of HDS-2A catalyst. Tests were hampered by plugging of lines caused by coal fines agglomeration in several process lines. At higher gas flow rates, entrainment of gas down the recycle cup became significant. After seventeen tests were completed, the pilot plant testing was postponed in order to modify pilot plant piping. Northwestern University continued development work on optical and electrical probes and began checkout of the laser holographic apparatus. Appendix A has been entered individually into EDB and ERA.

DE82008073 MF **A01**
VTN Consolidated, Inc., Irvine, CA.
In Support of Heber Ethanol Fuel Facility, Imperial Valley, California. Quarterly Report No. 1, December 1980-February 1981.
Apr 81, 29p DOE/SF/11429-T1
Contract FG03-80SF11429
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Progress is reported on the following tasks and issues: geothermal resource evaluation, process engineering, marketing, environmental concerns, and permit processing and legal issues. (ERA citation 07:046512)

DE82008214 MF **A01**
Hydrocarbon Research, Inc., Lawrenceville, NJ.
Laboratory Program to Support H-Coal Pilot-Plant Operations. Volume III. PDU Run 8.
Feb 82, 131p DOE/ET/10152-T11-V.1, FE-2547-46-Vol.1
Contract AC05-77ET10152
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

PDU Run 8 operated successfully for a period of twenty-three days in the fuel oil and intermediate modes without interruption during transition. In the first fourteen days, the operation was conducted in the fuel oil mode for 274 hours at a coal space velocity of 78 lbs/h/ft exp 3 . The coal feed rate was then lowered to 65 lbs/h/ft exp 3 for operation in the transition mode for eighty hours in Periods 15 to 18. Forty drums of hydroclone underflow were collected during Periods 13 to 18 for further tests designed to establish the most favorable operating conditions for the solvent precipitation system at the Catlettsburg, Kentucky H-COAL Pilot Plant. The intermediate mode operation was conducted for 108 hours in Periods 19 to 23 at a coal space velocity of 50 lbs/h/ft exp 3 . A new solvent precipitation system was placed on line in Period 22 to 23 and operated satisfactory with 0.01% ash in the overflow product. A two-stage letdown system, naptha stabilizer and coal surface dryer were installed for this run and performed satisfactorily. The data acquisition system was fully integrated with the PDU for the entire run. Biomodal PDU operation was demonstrated; the run was initiated in the fuel oil mode and was gradually changed to the intermediate mode. Forty drums of hydroclone underflow were produced for subsequent testing by Lummus. The solvent precipitation system produced an overflow product containing 0.01% ash, thereby demonstrating the feasibility of the system.

DE82009941 MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Energy Systems Div.
Status of Materials Evaluation for Sulfuric Acid Vaporization and Decomposition Applications.
R. L. Ammon. 1982, 22p CONF-820605-16
Contract AC02-78ET20608
World hydrogen energy conference, Pasadena, CA, USA, 13 Jun 1982, Portions of document are illegible. Available in microfiche only.

During the past three years a number of candidate materials have been screened for possible application in the acid vaporizer and SO sub 3 reduction reactor of the Westinghouse Sulfur Cycle. The progress of the screening tests and details of the test apparatus have been reported in previous status reports. The initial screening tests have been completed and based on metallographic inspection, reference materials were selected for further endurance testing. Silicon carbide was selected as the reference acid vaporizer material and four reduction reactor alloys, Carpenter 20Cb3, 444 (18Cr-2Mo-Ferritic SS), Incoloy 800 and Hastelloy Ge were selected for endurance testing. Incoloy 800 and Hastelloy G were Alonized (aluminum diffusion coated). Selection of a reference reduction reactor material will be aided by endurance test results, which are in progress. (ERA citation 07:044142)

DE82012321 MF **A01**
Water Purification Associates, Cambridge, MA.
BOD Limit in Synfuel Plants' Cooling-Tower Makeup.
O. Aiyegbusi, and D. J. Goldstein. 1982, 7p DOE/EV/10367-24, CONF-820532-1
Contract AC02-80EV10367
ASCE conference on water and energy: technical and policy issues, Pittsburgh, PA, USA, 1 May 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A model cooling tower/trickling filter was used to study acceptable BOD level in wastewater reuse as cooling system makeup and the effect on the system biofouling. Tap water was used to makeup for evaporation and blowdown while phenol solution was metered as the contaminant, into the circulating water. The phenol was degraded in the tower with less than 2 ppM in circulation at equivalent makeup concentrations below 1200 mg BOD/L. The rate of biofouling, measured by heat transfer coefficient, was correlated with phenol loading rates. Makeup concentrations below 1000 mg BOD/L gave low fouling rates while concentration above 1200 mg BOD/L resulted in intolerable fouling of exchanger tubes.

DE82012396 MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Gas Characterization from Fluidized-Bed Coal Gasification. Second Quarterly Report, December 1-February 28, 1982.
D. F. Ciliberti, E. E. Smeltzer, N. T. Rohatgi, M. A. Alvin, and D. L. Keairns. 1982, 30p DOE/MC/16024-T2
Contract AC21-81MC16024
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Westinghouse Electric Corporation proposed to characterize the nature of alkali, trace metal, particulate, and hydrocarbon emissions in the hot fuel gas stream produced in the Westinghouse fluidized bed gasifier. This program would be carried out to determine the potential environmental and process implications of these emissions. The characterization would consist of determining the amounts of contaminants associated with the particulate emissions relative to the amounts and types of gaseous species. The particulate-associated contaminants would be further analyzed to determine their soluble and insoluble fractions as well as the particular species present. The primary method of sampling will be based on isokinetic extractive sampling. Upon analysis of the species and amounts of alkali, trace metal, and hydrocarbons found, attempts will be made to correlate the effects of feedstocks and operating parameters with these emissions. This will be used to develop a basis for projecting emission profiles in fluidized bed gasification processes. (ERA citation 07:042040)

DE82012444 MF **A01**
Exxon Research and Engineering Co., Florham Park, NJ.
EDS Coal-Liquefaction Process Development. Phase V. Quarterly Technical Progress Report for the Period October 1-December 31, 1981.
Mar 82, 312p DOE/ET/10069-T17, FE-2893-83
Contract FC01-77ET10069
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Operation of the recycle liquefaction units and the coal liquefaction pilot plant with various coals is reported giving yields and product data. Solvent hydrogenation studies at low process pressure (900 psig) showed that the severity of hydrogenation at these conditions decreased in agreement with the model of hydrogenation. Combustion tests of coal-derived fuels were performed in a 1450 hp boiler. Fractionation and hydrogenation of coal liquids was carried out to prepare experimental gasoline blending stock and diesel fuels (with cetane improvers). Experiments involving radioactive tracers were carried out to get data on holdups, residence time and the degree of backmixing needed for plant engineering and design. Other operations are discussed briefly. (ERA citation 07:041993)

DE82012474 PC **A05**/MF **A01**
Utah Univ., Salt Lake City. Dept. of Mining and Fuels Engineering.
Chemistry and Catalysis of Coal Liquefaction: Catalytic and Thermal Upgrading of Coal Liquid and Hydrogenation of CO to Produce Fuels. Quarterly Progress Report, October-December 1981.
W. H. Wiser. Mar 82, 81p DOE/ET/14700-9
Contract AC22-79ET14700
Portions of document are illegible.
Microfiche only after original copies are exhausted.

Experiments on the upgrading of coal liquids by catalytic hydrogenation are reported. The work discusses catalysts, nuclear magnetic resonance and other related basic research. (ERA citation 07:042019)

DE82012928 MF **A01**
Institute of Gas Technology, Chicago, IL.
Hydropyrolysis of Biomass and Related Materials for the Production of Liquids.
W. W. Bodle, and K. A. Wright. 1982, 23p CONF-820127-5
Contract AC01-76ET10255
Annual conference on energy from biomass wastes, Lake Buena Vista, FL, USA, 25 Jan 1982.
Best available copy from document source. Available in microfiche only.

Test data for the pyrolytic conversion of eucalyptus wood, leucaena wood, and peat to liquid fuel have been analyzed. Charts have been developed to facilitate prediction of the quantity and composition of the various end products as a function of operating conditions such as temperature, pressure, and carrier gas composition.

DE82013410 MF **A01**
Princeton Univ., NJ. Dept. of Chemical Engineering.
Short-Residence-Time Hydropyrolysis of Coal. Technical Progress Report.
D. A. Saville, and W. B. Russel. 1982, 24p DOE/ET/13153-T8, PU-3153-7
Contract AC01-79ET13153
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

In this report we present kinetic data on the rapid pyrolysis and hydrolysis of a second coal along with a summary of other work to date. (ERA citation 07:042018)

DE82013414 PC **A03**/MF **A01**
SRI International, Menlo Park, CA.
Exploratory Study of Coal-Conversion Chemistry. Quarterly Report No. 3, November 19, 1981-February 18, 1982.
D. S. Ross, D. F. McMillen, W. C. Ogier, R. Bunnell, and G. P. Hum. Mar 82, 46p DOE/PC/40785-3
Contract AC22-81PC40785

Work in Task A has provided additional data on the rate and mechanisms of radical-induced cleavage of strong C-C and C-0 bonds in coal structures. This work has shown that even resonance-stabilized radicals, which form relatively weak C-C bonds, can displace other resonance-stabilized radicals from methylene-bridged coal structures. Kinetic studies reveal that either the self-disproportionation of 1,2-dihydronaphthalene is much faster than previously reported or that the 1,2-dihydronaphthalene-tetralin disproportionation is much less important as a radical initiation process than thermochemical estimates had suggested. 1,2'-Dinaphthylmethane undergoes radical-induced CH sub 2 -Ar bond scission ten times faster than diphenyl ether. This factor is shown to be consistent with the thermochemistry of displacement by tetralyl radical. In Task B we studied CO/H sub 2 O conversion of a second, high volatile bituminous coal, PSOC-233. We found that, as with PSOC-026, the initial pH did affect the conversion rate, increasing with higher pH. We also conducted experiments with several oxygen-containing model compounds in CO/D sub 2 O at 400 exp 0 C for 20 min. We had shown earlier in preliminary control experiments that simple aromatics, such as toluene, did not incorporate deuterium under these conditions. This quarter we found that anisole (Ph-O-CH sub 3) was converted to several products, with benzene as the most prominent. About 60% of the anisole was recovered in several experiments with mass balances at about 85%. There was a net incorporation of

deuterium in the product benzene. The corresponding conversion in tetralin under the same conditions was two orders of magnitude slower and yielded phenol as the major product. We conclude that in the aqueous medium a chain process can occur that yields phenyl radical, which can then receive protium from a starting anisole or deuterium from the mineral medium. (ERA citation 07:042062)

DE82013693 MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA. Fluid Thermochemistry Dept.
Quarterly Technical Progress Report No. 2, December 20-March 19, 1982. Second Quarterly Report on the Effect of Rapid Heating Rate on Coal Nitrogen and Sulfur Release.
N. Gat. 26 Apr 82, 64p DOE/PC/40273-T2
Contract AC22-81PC40273
Portions of document are illegible.
Microfiche copies only.

A laser pyrolysis technique is applied to the investigation of the effects of heating rate on release of coal-bound sulfur and nitrogen. An experimental system characterization and calibration has been completed. A detailed documentation was prepared describing the 3-color pyrometer and the data analysis technique. The coal particle feed system has been calibrated to provide accurate mass flow rate at pre-selected particle velocities. The first batch of samples submitted for chemical analysis will be used for the determination of kinetics parameters at a high heating rate (approximately equal to 10 exp 6 K/s). The coal used presently is a Montana Rosebud. Two other coals are available; one is ILL No. 6 (through EERC) which will need to be pulverized and the second is a Pitt. hv-A (through KVB). It was confirmed that sieve and drag size distribution of coal differ significantly, and that particle shape effects may be significant in the modelling of particle dynamics. (ERA citation 07:042059)

DE82014644 MF **A01**
Lawrence Livermore National Lab., CA.
Occurrence and Reactions of Oil Shale Sulfur.
A. K. Burnham, and R. W. Taylor. Apr 82, 22p UCRL-87052, CONF-820441-3
Contract W-7405-ENG-48
15. oil shale symposium, Golden, CO, USA, 27 Apr 1982, Portions of document are illegible.
Available in microfiche only.

We first discuss the nature and abundance of sulfur forms in Green River oil shale. A previously reported correlation between sulfur and grade does not work well over a very large geographical region. We next discuss the distribution of sulfur in the pyrolysis products, including trace sulfur species in the gas, and the reactions of steam and air with iron sulfides in the shale. Steam reactions increase H sub 2 S generation in both laboratory and pilot retort experiments. There is a related decrease in COS production with steam. We also discuss the contribution of sulfur to process heat and demonstrate the effectiveness of sulfate-forming reactions to minimize SO sub 2 emissions during combustion of retorted shale under conditions simulating lift-pipe burners. The information presented should be of value for properly considering the effects of sulfur when designing oil shale processes. (ERA citation 07:042367)

DE82014735 PC **A02**/MF **A01**
Mechanical Technology, Inc., Fairfax, VA.
High Temperature Packing Test Program. Second Quarterly Technical Progress Report, December 27, 1981-March 27, 1982.
15 Apr 82, 16p MTI/WDC-82TR515
Contract AC22-81PC40090
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Microfiche only after original copies are exhausted.

The program was undertaken to improve the technical understanding of the performance of plunger packings in coal liquefaction pilot plant feed pumps. The operating, maintenance and engineering data from the three coal liquefaction pilot plants (EDS, H-Coal, and SRC-I) were reviewed with the personnel at each plant, analyzed, and are reported. The state-of-the-art recommendations from three plunger pump manufacturers and seven packing vendors were analyzed to select candidate packing combinations for the test program, and are reported. Static compatibility tests, exposing candidate packing combinations for 100 hours to 300 exp 0 F solvent from each pilot plant are two-thirds complete. Components for the dynamic test system are being assembled.

DE82014906 PC **A03**/MF **A01**
Argonne National Lab., IL.
Analysis of a Failed Spent-Char Transfer Line from the IGT HYGAS Coal-Gasification Pilot Plant.
M. C. Shin, D. R. Diercks, and G. M. Dragel. Mar 82, 36p ANL/FE-82-5
Contract W-31-109-ENG-38
Microfiche only after original copies are exhausted.

A failed spent-char transfer line from the IGT HYGAS Coal-Gasification Pilot Plant has been analyzed. The line was fabricated primarily of RA 330, except for one length of Incoloy 800 piping and Type 316 stainless steel hub pieces at each end of the horizontal line. Cracking occurred at three locations in the horizontal portion of the line. At one of these locations, namely the downstream hub, the cracking was accompanied by substantial corrosive attack. Little or no corrosion was noted at the other two failure sites. The failures were attributed to a combination of: (1) thermal stresses produced by temperature cycles experienced during the discharge of hot char; and (2) sulfidation caused by prolonged or repeated contact of the line with sulfur-containing hot char. It was recommended that the horizontal portion of the line be redesigned to reduce mechanical constraints, that the severity of the imposed temperature cycles be reduced if possible, and that the hub pieces be fabricated of a more sulfidation-resistant alloy such as Incoloy 800 or RA 330.

DE82016228 MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Operation and Testing Experience with the DOE Small-Scale Fuel Alcohol Plant.
R. E. McAtee, L. Dawley, J. H. Wolfram, and R. C. Schmitt. Apr 82, 49p EGG-2168
Contract AC07-76ID01570
Portions of document are illegible.
Available in microfiche only.

This document contains information and data pertaining to the operation and testing of the Small-Scale Fuel Alcohol Plant (SSFAP). Operation and testing with this plant occurred mostly during FY-81 under limited budget conditions. The information produced in the SSFAP about operations, necessary equipment modificatons, yeast an enzyme optimization, process quality assurance, laboratory versus plant results, plant performance with alternative feedstocks, safety, and operating procedures should be of value throughout the industry. Laboratory experimentation and subsequent trial runs of a number of starch-containing cereal grains conclusively demonstrated the flexibility and effectiveness of this facility. Once shakedown and startup was completed, the plant routinely achieved yields of 2.6 gal of ethanol per bushel of corn. Further trial runs were conducted to reduce the cost of materials used in alcohol production by using smaller amounts of enzyme and yeast. After plant operating parameters and conversion efficiency were optimized, barley, corn dust, and dried potato waste were tested as potential feedstocks, and all performed admirably, withmore than 90% conversion of the available starch to alcohol.

DE82903665 MF **A01**
C-E Power Systems, Windsor, CT.
Effect of Liquefaction Processing Conditions on Combustion Characteristics of Solvent-Refined Coal.
G. J. Goetz, T. C. Lao, A. K. Mehta, and N. Y. Nsakala. Mar 82, 176p EPRI-AP-2328
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

One of several direct liquefaction processes currently under advanced stages of development is the Solvent-Refined Coal-I (SRC-I) process. A major SRC-1 product option is a low sulfur, low ash solid (SRC) which could be used as an electric utility boiler fuel much in the same manner that pulverized coal is currently fired in this type of combustion equipment. SRC-I processing has been performed using three variations in the manner in which mineral matter and unconverted coal are separated from the hot coal liquid. These processes are the Pressure Filtration Deashing (PFD), Anti-Solvent Deashing (ASD), and Critical Solvent Deashing (CSD). Since processing conditions may influence the combustion of SRC-I solids produced, an experimental program was carried out at both the bench and pilot plant scale to determine the influence of processing (i.e. solids separation method) and combustion conditions on carbon burnout of these three varieties of SRC solid boiler fuels. Included in this study was an examination of NO/sub x/ emissions (particularly for the CSD SRC and PFD SRC) with the objective of attaining low NO/sub x/ emissions without adversely affecting combustion efficiency. The work was carried out at the laboratory, bench and pilot plant scales employing Thermo-Gravimetric analyses, Drop Tube Furnace testing, and Controlled Mixing History furnace testing, respectively. Reactivity and NO/sub x/ emissions results were compared with those obtained from two coals previously tested and used as reference coals. One of these coals was a high reactivity Wyoming subbituminous coal and the other was a low reactivity Kentucky high volatile bituminous coal. The type of processing scheme used in the SRC-I deashing step was found to have a major impact on the combustion properties of the resultant solid SRC product. (ERA citation 07:042080)

N82-29377/0 PC **A03**/MF **A01**
Bend Research, Inc., OR.
Membrane Separation Technology in the 1980S.
Final Report.
H. K. Lonsdale. 2 Mar 82, 45p NASA-CR-169203, NAS 1.26:169203
Contracts NAS7-100, JPL-956158
Prepared for JPL.

The current status of membrane technology is assessed and industrial processes in which membrane technology could effect energy savings or other advantages are identified. The extension of current trends is recommended; i.e., the development of ultrathin and highly permselective membranes, the use of specific carriers to enhance permselectivity and permit 'uphill' diffusion, and the improvement of separation efficiency. Membranes are predicted to be important in biotechnology and in the production of solar energy. Guidelines indicating where and how to look for opportunities where evolving membrane technology might fit are provided.

PATENT-4 330 570 Not available NTIS
Department of the Navy, Washington, DC.
Selective Photoinduced Condensation Technique for Producing Semiconducting Compounds.
Patent,
John F. Giuliani, and Abe Auerbach. Filed 24 Apr 81, patented 18 May 82, 7p AD-D009 626/3, PAT-APPL-6-257 028
Supersedes PAT-APPL-6-257 028, AD-D008 550.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A process for producing a variety of organic-inorganic luminescent and semiconductive compounds or materials in the form of a film deposited directly on the surface of a substrate by ultraviolet photoinduced condensation from gaseous reactants such as antimony pentafluoride (SbF5)n and organic or inorganic halogen-containing compounds. The process provides a new class of antimony (Sb) doped luminescent and semiconductive materials which can be produced on any arbitary size or shape substrate, or even on existing substrates of other semiconductive materials or chips, to form semiconductive devices. The process may be used in photoinducing luminescent panel displays or microelectronic circuits, such as integrated electrical or optical circuits. (Author)

PB82-264276 Not available NTIS
National Bureau of Standards, Washington, DC.
Membrane Separations.
Thomas M. Flynn, and J. Douglas Way. Jun 82, 4p
Pub. in Energy Program 2, n2 p79-82 Jun 82.

Rapidly rising energy and operating costs have underscored the need for novel energy efficient separation processes, such as membrane processes, which avoid the energy consuming phase change step of many conventional separations (e.g., distillation, absorption, stripping). It is well known that membrane separation is the most energy efficient separation technique thermodynamically possible, since it does not rely upon vaporization and condensation to effect fractionation. Recent developments in solid polymer, hollow fiber and liquid membranes give excellent promise for industrial application. Hence, because of recent technological developments of these new membranes, and because of its great energy savings potential, research

is being conducted on the fundamentals determining separation rates, separation factors, and selectivity of new types of solid and liquid membranes with potential application to the chemical process industry.

PB82-875832 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Hydrocracking: Processes and Applications. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 226p
Supersedes PB81-851602.

This bibliography contains citations concerning hydrocracking processes for organic and inorganic materials. The catalysts used during these processes are discussed and the applications are presented. (This updated bibliography contains 171 citations, 49 of which are new entries to the previous edition.)

PB82-876103 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Organic Solvent Recovery and Reclamation. June, 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 256p
Supersedes PB80-851496.

This bibliography contains citations concerning solvent recovery and reclamation technology. Extraction, recovery, and reclamation of solvents and components of solvents which are utilized in various mineral, manufacturing, processing, and reprocessing industries are discussed. (This updated bibliography contains 202 citations, 69 of which are new entries to the previous edition.)

PB82-876111 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Organic Solvent Recovery and Reclamation. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 108p
Supersedes PB80-851512.

This bibliography contains citations concerning solvent recovery and reclamation technology. Extraction, recovery, and reclamation of solvents and components of solvents which are utilized in various mineral, manufacturing, processing, and reprocessing industries are presented. Design, operation, performance, and maintenance of equipment utilized for this purpose are included. (This updated bibliography contains 105 citations, 35 of which are new entries to the previous edition.)

7B. Inorganic Chemistry

DE82007772 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Characterization of Aerosol Sulfur, Carbon, and Nitrogen by ESCA and Thermal Analysis.
T. Novakov. Jan 82, 4p LBL-13875, CONF-820609-19
Contract W-7405-ENG-48
American Nuclear Society annual meeting, Los Angeles, CA, USA, 6 Jun 1982.

Results are presented of the application of photoelectron spectroscopy and evolved gas analysis to the characterization of sulfur and nitrogen species in atmospheric particulate matter. (ERA citation 07:047995)

DE82903071 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ciclo del Combustibile.
Extraction of Uranium (VI) From Nitric Acid Solutions with N,N,-di-N-Butyloctanamide.
W. Dembinski, and G. M. Gasparini. Dec 80, 36p
CNEN-RT/CHI-(80)14
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

N,N-dialkylamides show interesting properties as new extracting agents of actinides. This report presents the data concerning the N,N-di-n-butyloctanamide: CH sub 3 -(CH sub 2) sub 5 -CH sub 2 -C(O)N (C sub 4 H sub 9) sub 2 . In particular the following have been studied: the formation of a third phase with n-dodecane and mesitylene as diluents; the influence of the concentration of the uranium of the nitric acid and of the extractant on the distribution coeffcient, of uranium(VI); the radiation stability of this amide and the influence of the absorbed dose on the distribution coefficient for U(VI). The general properties of the di-n-butyloctanamide as potential extractant of uranium are discussed. (ERA citation 07:044246)

7C. Organic Chemistry

AD-A118 552/9 PC **A02**/MF **A01**
State Univ. of New York at Albany. Dept. of Chemistry.
Competing beta Fragmentation in Regeneration of Alcohols from Arenesulfonates with Arene Anion Radicals,
W. D. Closson, John R. Ganson, Sung W. Rhee, and Karen Saboda Quaal. 27 Nov 81, 5p AFOSR-TR-82-0628
Grant AFOSR-77-3241
Pub. in Jnl. of Organic Chemistry, v47 n12 p2476-2479 1982.

No abstract available.

AD-A118 630/3 Not available NTIS
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
Use of Highly Cross-Linked Polystyrene Supports for Acylation and Alkylation of an Ester Enolate at Room Temperature,
Young H. Chang, and Warren T. Ford. 30 Jul 81, 9p ARO-16527.5-CH
Contract DAAG29-79-C-0195
Availability: Pub. in Jnl. of Organic Chemistry, v46 n26 p5364-5371 1981 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 636/0 Not available NTIS
Colorado Univ. at Boulder. Dept. of Chemistry.
Flowing Afterglow Studies of the Reactions between Negative Ions and Trimethylsilyl Enol Ethers. Regiospecific Generation of Gas Phase Enolate Ions,
Robert R. Squires, and Charles H. DePuy. 24 Sep 81, 6p ARO-16004.9-CH
Grants DAAG29-79-G-0012, NSF-CHE79-09750
Availability: Pub. in Organic Mass Spectrometry, v17 n4 p187-191 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 671/7 PC **A02**/MF **A01**
Polytechnic Inst. of New York, Brooklyn. Dept. of Chemistry.
Investigation of Denitration Reactions of Unsymmetrical Trinitrotoluenes to 2,4-Dinitrotoluene.
Final rept. Mar 80-Dec 81,
Y. Okamoto, S. T. Attarwala, and M. Bochnik. Aug 82, 25p ARLCD-CR-82037, SBI-AD-E400 880
Contract DAAK10-80-C-0031
Project engineer: E. E. Gilbert

Several methods were tested for reductive denitration of 2,4,5-trinitrotoluene to 2,4-dinitrotoluene. Tin-hydrochloric acid and ion-hydrochloric acid gave a 10% yield of the desired material; other reagents gave none.

AD-A118 754/1 PC **A22**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA.
Research and Development of Methods for Estimating Physicochemical Properties of Organic Compounds of Environmental Concern. Part 1.
Final rept. May 79-Jun 81 on Phase 2,
Warren J. Lyman, William F. Reehl, and David H. Rosenblatt. Jun 81, 505p Rept no. ADL-C-82426-PT-1
Contract DAMD17-78-C-8073
See also report dated Feb 79, AD-A074 829.

This report contains selected, evaluated estimation methods for 26 environmentally important physicochemical properties of organic chemicals. The methods selected are applicable to a variety of chemical classes, are easy to use, require a minimum of input data, and are reasonably accurate. Each method has a descriptive text, step-by-step instructions, worked-out examples, and supplementary information allowing the user to estimate the likely uncertainty of an estimated value. Approximately 800 literature references cited. (Author)

AD-A118 772/3 PC **A02**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Chemistry.
Singlet-Oxygenation of a Conjugated Diallene: Attempt to Prepare a Stable Divinyl Peroxide.
Technical rept.,
Robert C. Mebane, and Gary B. Schuster. 20 Aug 82, 17p
Contract N00014-76-C-0745

A conjugated diallene, 2-3-divinylidenebicyclo(2.2.1)heptane, was prepared and isolated. Photosensitized oxygenation of this allene leads to two isolated oxygenated products in 50% yield. Detection of these products is interpreted to implicate an unstable cyclic divinyl peroxide intermediate. Attempts to detect this intermediate by low temperature nmr spectroscopy and by chemiluminescence were unsuccessful. The instability of this compound is attributed to the destabilizing lone pair interaction of the peroxide oxygen atoms. (Author)

AD-A118 838/2 PC **A08**/MF **A01**
Battelle Memorial Inst., Columbus, OH. Columbus Labs.
Analytical Techniques for Aromatic Components in Aircraft Fuels.
Final technical rept. 15 Jun 78-30 Sep 81,
J. S. Warner, T. H. Danison, and J. S. McNulty. May 82, 157p AFWAL-TR-82-2015
Contract F33615-78-C-2019

An ultraviolet detector was shown to be highly satisfactory for the selective determination of aromatic components in jet fuels. The detector was operated at 208 nm and used with a fused silica capillary column gas chromatographic system. The detector gave a linear response in the range of interest and could detect individual benzenes and naphthalenes in jet fuels at levels down to 0.01% and 0.002% respectively. Nitrogen-containing compounds were determined by the use of an alkali flame detector, high pressure liquid chromatography, and mass spectrometry. (Author)

DE82902533 MF **A01**
GKSS - Forschungszentrum Geesthacht G.m.b.H., Geesthacht-Tesperhude (Germany, F.R.)
Morphologic Studies of Bentonite-Stabilized Cellulosediacetate Membranes.
P. Lemburg, and H. Finken. 1980, 40p GKSS-80/E/53
In German.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Preparation and pressure-osmotic properties of bentonite-stabilized Cellulosediacetate membranes are described. The improved salt and water permeabilities and long-term flux stability are compared and discussed with morphological investigations carried out by scanning electron microscopy. The results of membrane cross-section photomicrographs support a three-layer structure model for the integral-asymmetric membranes investigated with an active skin-layer, a transition zone and a porous sublayer. The influence of bentonite addition on structure of transition zone is clearly demonstrated. This zone is often crossed by conically-shaped caverns, but it also shows a remarkably denser structure compared to a reference membrane. (ERA citation 07:044217)

PATENT-4 315 093 Not available NTIS
Department of the Navy, Washington, DC.
Fluorinated Polyphthalocyanines.
Patent,
Teddy M. Keller, and James R. Griffith. Filed 9 Nov 79, patented 9 Feb 82, 6p AD-D009 663/6, PAT-APPL-6-092 909
Supersedes PAT-APPL-6-092 909.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

An objective of this invention is to provide a polyphthalocyanine resin with improved water repellency. Another object of this invention is to provide a polyphthalocyanine resin which is stable at a temperature above 235 C. A further object of this invention is to provide a polyphthalocyanine which is more resistant to oxidative attacks. These and other objects are achived by synthesizing perfluorinated phthalonitriles and forming polyphthalocyanine resins therefrom, thereby obtaining a resin with highly water-repellant and oxidation-resistant fluorocarbon bridging chains. (Author)

7D. Physical Chemistry

AD-A118 482/9 PC **A05**/MF **A01**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
The Kinetics and Spectroscopy of Aircraft and Rocket Plume Constituents.
Final technical rept. 1 Jun 77-30 Sep 80,
F. P. Tully, and A. R. Ravishankara. 10 Dec 80, 86p
AFOSR-TR-82-0624
Contract F49620-77-C-0011
See also AD-A090 948.

During the course of this program experimental investigations were carried out to meet two objectives: (1) to measure the temperature dependence of rate coefficients of radical-molecule and molecule-molecule reactions of specific importance in modeling of combustion and plume processes, and (2) to contribute to the general understanding of the temperature dependence of bimolecular reactions, particularly as it relates to observed curvature in Arrhenius plots.

AD-A118 533/9 PC **A02**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
A Sum Rule for an Inhomogeneous Electrolyte,
Lesser Blum, Douglas Henderson, Joel L. Lebowitz, Ch. Gruber, and Ph. A. Martin. 16 Jun 81, 3p
AFOSR-TR-82-0602
Grants AFOSR-73-2430, NSF-CHE80-01969
Pub. in Jnl. of Chemical Physics, v75 n12 p5974-5975, 15 Dec 81.

No abstract available.

AD-A118 540/4 PC **A04**/MF **A01**
Hull Univ. (England). Dept. of Chemistry.
Kinetics of Hydrogen-Oxygen and Hydrocarbon-Oxygen Reactions.
Final scientific rept. 1 Apr 77-30 Jun 81,
Robert R. Baldwin, and Raymond W. Walker. Aug 81, 69p AFOSR-TR-82-0623
Grant AFOSR-77-3215
See also AD-A092 931.

Rate constants of the H2 + 02 reaction at 500 C hae been refined. Rate constants and Arrhenius parameters for reactions of H atoms and OH radicals with C2-C5 alkanes, 2,2,3,3-tetramethylbutane (TMB) and 2,2,3-trimethylbutane (TRIMB) have been obtained. Detailed studies have been made of the products from the oxidation of 1-butane, n-pentane, neopentane, TMB and TRIMB. Rate constants for R + 02 = conjugate alkene, for homolysis of R Radicals, and for the isomerisation of R02 radicals to hydroperoxyalkyl radicals have been tabulated for a range of radicals.

AD-A118 556/0 PC **A02**/MF **A01**
Northwestern Univ., Evanston, IL. Dept. of Physics and Astronomy.
Electronic Structure, Spin Polarization and High Critical Fields in Chevrel Compounds,
T. Jarlborg, and A. J. Freeman. 1 Dec 81, 19p
AFOSR-TR-82-0640
Grant AFOSR-81-0024
Pub. in Jnl. of Magnetism and Magnetic Materials, v27 n2 p135-151 May 82.

No abstract available.

AD-A118 586/7 PC **A03**/MF **A01**
SRI International, Menlo Park, CA.
Theoretical Study of State-to-State Collisions.
Final scientific rept. 1 May 80-30 Apr 82,
Christopher H. Becker, Roberta P. Saxon, and Albert P. Hickman. 29 Jun 82, 44p SRI-MP-82-063, AFOSR-TR-82-0668
Contract F49620-80-C-0064

The probability of making transitions between specifically known molecular states in collisional processes has been investigated theoretically. Fully quantum mechanical close-coupled calculations of electronic-vibrational-translational energy exchange for model atom-diatomic potentials have been performed. The process of ion-pair formation was investigated in this work. Symmetric charge exchnage in diatomic ion-diatomic molecule collisions was also studied. Nonadiabatic collisions were studied by quasi-classical and quantum perturbation methods as well. Finally, scaling laws for collisions of atomic Rydberg states with atoms and molecules have been developed. (Author)

AD-A118 593/3 PC **A02**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
Ultrahigh-Vacuum Techniques in the Measurement of Contact Angles. 5. LEED Study of the Effect of Structure on the Wettability of Graphite 1, 2.
Research and development rept.,
Malcolm E. Schrader. 5 Nov 79, 14p Rept no. DTNSRDC-82/065
Pub. in Jnl. of Physical Chemistry, v84 n21 p2774-2779, 16 Oct 80.

No abstract available.

AD-A118 624/6 Not available NTIS
Columbia Radiation Lab. New York.
Noble-Gas-Induced Collisional Broadening of the 6P1/2-6P3/2 Transition of T1 Measured by Raman Echoes,
K. P. Leung, T. W. Mossberg, and S. R. Hartmann. 5 Nov 81, 6p ARO-16431.70-EL
Contracts DAAG29-79-C-0079, N00014-78-C-0517
Availability: Pub. in Physical Review A, v25 n6 p3097-3101 Jun 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 625/3 Not available NTIS
Columbia Radiation Lab. New York.
Collision Kernels and Laser Spectroscopy,
P. R. Berman, T. W. Mossberg, and S. R. Hartmann. 24 Aug 81, 23p ARO-16431.71-EL
Contract DAAG29-79-C-0079
Availability: Pub. in Physical Review A, v25 n5 p2550-2571 May 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 627/9 Not available NTIS
Columbia Radiation Lab. New York.
Emission Spectra and Relaxation Dynamics of Excited 79Br2 in Ar and Kr Matrices,
Mary Mandich, Paul Beeken, and George Flynn. 29 Oct 81, 13p ARO-16431.53-EL
Contract DAAG29-79-C-0079
Availability: Pub. in Jnl. of Chemical Physics, v77 n2 p702-713 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 689/9 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Simulation of the Dropping Mercury Electrode by Orthogonal Collocation.
Technical rept.,
Stanley Pons, Bernd Speiser, J. McAleer, and P. P. Schmidt. 18 Aug 82, 13p Rept no. TR-13
Grant N00014-82-G-0017

The theory for the application of orthogonal collocation techniques to the dropping mercury electrode is given. The technique is shown to adapt readily to non-linear geometries. (Author)

AD-A118 705/3 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Vibrational Spectroscopy of the Electrode-Solution Interphase. II. Use of FTIR Spectroscopy for Recording IR Spectra of Radical Ion Intermediates.
Technical rept.,
Stanley Pons, Timothy Davidson, and Alan Bewick. 18 Aug 82, 12p Rept no. TR-15
Grant N00014-82-G-0017
See also AD-A118 706.

Results for the recording of the radical ions formed in the reduction of benzophenone, tetracyanoethylene and anthracene are presented. (Author)

AD-A118 706/1 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Vibrational Spectroscopy of the Electrode-Solution Interphase. III. Use of FTIR Spectroscopy for Observing Double Layer Reorganization.
Technical rept.,
Stanley Pons, Timothy Davidson, and Alan Bewick. 18 Aug 82, 9p Rept no. TR-10
Grant N00014-82-G-0017
See also AD-A118 707.

Results are presented for experiments designed to observe structural changes in the electrical double layer under different potential modulations. Results are presented for non-aqueous systems in this report.

AD-A118 707/9 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Vibrational Spectroscopy of the Electrode-Solution Interphase. IV. FTIR: Experimental Considerations.
Technical rept.,
Stanley Pons, Timothy Davidson, and Alan Bewick. 18 Aug 82, 14p Rept no. TR-16
Grant N00014-82-G-0017
See also AD-A118 705.

The experimental details for the gathering of high quality infrared spectra in the electrode-solution interphase are given.

AD-A118 708/7 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Simulation of Edge Effects in Electroanalytical Experiments by Orthogonal Collocation. Part I. Two Dimensional Collocation and Theory for Chronoamperometry.
Technical rept.,
Bernd Speiser, and Stanley Pons. 18 Aug 82, 10p Rept no. TR-8
Grant N00014-82-G-0017
See also Part 2, AD-A118 709.

The details for accurate simulation of edge effects experienced at disc electrodes in chronoamperometric experiments is given.

AD-A118 709/5 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Simulation of Edge Effects in Electroanalytical Experiments by Orthogonal Collocation. Part II. The Theory for Cyclic Voltammetry by Collocation.
Technical rept.,
Bernd Speiser, and Stanley Pons. 18 Aug 82, 21p Rept no. TR-9
Grant N00014-82-G-0017
See also Part 3, AD-A118 710.

The procedure and theory for simulation of currents perturbed by edge effects at disc electrodes in cyclic voltammetric experiments is presented. The results are obtained rapidly and accurately.

AD-A118 710/3 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Simulation of Edge Effects in Electroanalytical Experiments by Orthogonal Collocation. Part III. Application to Chronoamperometric Experiments.
Technical rept.,
Bernd Speiser, and Stanley Pons. 18 Aug 82, 22p Rept no. TR-14
Grant N00014-82-G-0017
See also Part 1, AD-A118 708.

Comparisons of simulated results with theory for chronoamperometric systems is presented. Results for complicated systems are obtained with high accuracy in very short periods of time.

AD-A118 711/1 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Electroanalytical Investigations. IV. Use of Orthogonal Collocation for the Simulation of Quasireversible Electrode Processes under Potential Scan Conditions.
Technical rept.,
Bernd Speiser, Stanley Pons, and Anton Rieker. 18 Aug 82, 15p Rept no. TR-11
Grant N00014-82-G-0017

The procedure for simulating quasireversible electron transfer systems for cyclic voltammetry experiments is presented, and the procedure applied to several systems. The technique is based on orthogonal collocation. (Author)

AD-A118 712/9 PC **A02**/MF **A01**
Alberta Univ., Edmonton. Dept. of Chemistry.
Orthogonal Collocation Simulation of the Rotating Disc Electrode.
Technical rept.,
Bernd Speiser, Stanley Pons, and Jerome McAleer.
18 Aug 82, 10p Rept no. TR-12
Grant N00014-82-G-0017

The theory of orthogonal collocation as applied to rotating disc systems is presented and its advantages are described. The technique is extremely fast and application of chemical reactions is easily implemented. (Author)

AD-A118 726/9 Not available NTIS
Virginia Univ., Charlottesville. Dept. of Chemistry.
Nitric Oxide Chemical Ionization Mass Spectrometry of Alcohols.
Donald F. Hunt, T. Michael Harvey, William C. Brumley, James F. Ryan, III , and John W. Russell.
10 Jul 81, 7p ARO-17042.7-CH
Contract DAAG29-80-C-0101, Grant DAAG29-76-G-0326
Availability: Pub. in Analytical Chemistry, v54 n3 p492-496 Mar 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 782/2 PC **A02**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Chemistry.
Chemiluminescence from the Reaction of 2-Methylene-3-acetyloxazoline-4,5-dione with Hydrogen Peroxide.
Technical rept.,
Daniel Steffek, Robert C. Mebane, and Gary B. Schuster. 20 Aug 82, 13p
Contract N00014-76-C-0745

The reaction of 2-methylene-3-acetyloxazoline-4,5-dione (1) with hydrogen peroxide in the presence of a fluorescent aromatic hydrocarbon generates light. The mechanism for light generation was investigated and found to parallel that of oxalate esters. The reaction of dione (1) is catalyzed by added base, but the chemiluminescence intensity drops as the base concentration increases. A reaction sequence is proposed consistent with the experimental observations.

AD-A118 788/9 PC **A02**/MF **A01**
Chicago Univ., IL. James Franck Inst.
Bound Level Resonances in Rotationally Inelastic HD/Pt(111) Surface Scattering.
Technical rept.,
James P. Cowin, Chien-Fan Yu, Steven J. Sibener, and Jerry E. Hurst. 21 Apr 81, 7p Rept no. TR-1
Contract N00014-77-C-0240
Pub. in Jnl. of Chemical Physics, v75 n2 p1033-1034, 15 Jul 81.

No abstract available.

AD-A118 789/7 PC **A03**/MF **A01**
Chicago Univ., IL. James Franck Inst.
Rotationally Mediated Selective Adsorption as a Probe of Isotropic and Anisotropic Molecule - Surface Interaction Potentials: HD(J)/Ag(111).
Interim technical rept.,
Chien-Fan Yu, Charles S. Hogg, James P. Cowin, K. Birgitta Whaley, and John C. Light. Aug 82, 44p Rept no. TR-2
Contract N00014-77-C-0240

Rotationally mediated selective adsorption scattering resonances are used to make an experimental and theoretical study of the laterally averaged interaction potential between HD and a weakly corrugated system, Ag(111). The experimentally observed resonances determine the vibrational levels of the HD/Ag(111) physisorption potential as a function of bound rotational state. These vibrational levels show J-dependent shifts due to the orientational anisotropy of the potential. Exact quantum scattering calculations using a full laterally averaged potential of the form V sub o(z,0) = v sub o (z) (1 + beta P sub 2 (cos theta)) have been carried out to obtain rotationally inelastic transition probabilities. Experimental and theoretical resonance energies are compared for two forms of v sub o(z), a Morse and a variable exponent potential, as a function of Beta, and are found to be very close to the first order perturbed energies of a free rotor in bound states of v sub o(z). Both potential forms give equally good fits to the data, yielding an optimum value of the asymmetry parameter, Beta approx. -0.05. The determination of Beta is relatively insensitive to small changes in the v sub o(z) well depth. (Author)

AD-A118 801/0 MF **A01**
Center for Information and Numerical Data Analysis and Synthesis, West Lafayette, IN.
Absorption Coefficient of Alkali Halides. Part I.
Interim rept. 1 May 78-30 Apr 79,
H. H. Li. Mar 79, 262p CINDAS-54, AFOSR-TR-82-0687
Contract F49620-76-C-0105
See also Part 2, AD-A080 208.
Availability: Microfiche copies only.

Data on absorption coefficients of alkali halides were compiled and analyzed. The bulk of available data were concentrated to the absorption edges of the main transparent region and were for the seven materials LiF, NaF, NaCl, KC1, KBr, KI, and CsI. Although the intrinsic absorption can be calculated by using the exponential dependence of absorption coefficient on frequency, discrepancies occur in the region where absorption is extremely low. At low absorption levels, extrinsic absorptions due to impurities and surface contamination dominate the intrinsic absorption by factors ranging from fractions to factors by ten. Experience has shown that extrinsic contributions can be reduced through improved crystal preparation. Another possible reason for the discrepancies may be the limit of instrument sensitivity. The results of this work on the alkali halides are given in two separate reports. Presented in this report are essentially the up-to-date knowledge of available data and the recommended room-temperature values of absorption coefficient in the laser wavelength and multiphonon absorption region. In the second report, results on the data analysis and theoretical studies for the temperature dependence of absorption coefficient will be given.

DE82009680 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Concentration Profile of Hydrogen Near the Surface of Niobium.
M. A. Pick, A. Hanson, K. W. Jones, and A. N. Goland. 1982, 7p BNL-30904, CONF-820325-7
Contract AC02-76CH00016
International symposium on the electronic structure and properties of hydrogen in metals, Richmond, VA, USA, 4 Mar 1982.

Samples hydrided in two different ways were investigated. The materials used were thin foils (50 mu m, MARZ grade) of niobium, 10 x 25 mm in size. The two methods of hydriding produced different surface conditions which were the subject of the present investigation. One method consisted of the following procedures. The samples were outgassed and cleaned in UHV to remove virtually all the interstitial impurities from the bulk and surface. A small spot of Pd was then deposited onto the clean surface of the niobium in situ in the UHV-system by evaporation from a hot Pd filament. The second method of hydriding was similar to that used by most investigators of metal-hydrogen systems. A sample is placed in the hydriding unit and allowed to absorb a premeasured amount of hydrogen while cooling from approx. 800 C where the surface oxide is dissolved into the bulk. In order to study the effect of a poor vacuum in the hydriding unit, samples were heated to 800 C in different base pressures prior to the admission of hydrogen. One sample was heated in 1 x 10 exp -5 Torr oxygen.

DE82011665 PC **A02**/MF **A01**
Monsanto Research Corp., Miamisburg, OH.
Hydrogen Diffusion Behavior in Titanium-Chromium Hydrides with Laves Structures.
R. C. Bowman, Jr., B. D. Craft, A. Attalla, and J. R. Johnson. Jun 82, 10p MLM-2901, CONF-820605-5
Contract AC04-76DP00053
World hydrogen energy conference, Pasadena, CA, USA, 13 Jun 1982.

Extensive NMR measurements of the proton relaxation times have been performed on low (i.e., alpha - phase) and intermediate (i.e., alpha -phase) hydrogen concentrations in TiCr sub 2 H/sub x/ with both the hexagonal C14 and cubic C15 Laves structures. The relaxation times indicate rapid diffusion rates above 200 K for all the TiCr sub 2 H/sub x/ phases; however, large differences in the diffusion activation energies are observed. This behavior is associated with the hydrogen interstitial site occupancies and diffusion pathways becoming restricted in the C14 structure.

DE82012705 PC **A03**/MF **A01**
Aerodyne Research, Inc., Bedford, MA. Center for Chemical and Environmental Physics.
Chemical Kinetics of the NH sub 3 /NO Reaction System under Combustion Exhaust-Flow Conditions.
J. A. Silver, C. M. Gozewski, and C. E. Kolb. 1980, 36p ARI-RR-216, CONF-8010104-5
Contract ER-78-C-01-3183
Western states section of the combustion institute fall 1980 meeting, Los Angeles, CA, USA, 20 Oct 1980, Portions of document are illegible.

Quantitative understanding of the NH/sub i/NO/sub x/ reaction system is necessary to optimize the homogeneous removal of exhaust flow nitric oxide by ammonia addition and to minimize the formation of NO/sub x/ from fuel nitrogen. Attempts to model this chemistry have been hampered by a lack of high temperature rate constant and product branching ratio data for key reactions. Utilizing a unique high temperature flow facility, the rate constants for important initiation and propagation steps for the NH/sub i/NO/sub x/ reaction system have been measured over the temperature range 294 to 1200 exp 0 K. Product branching results have been incorporated into a chemical model which describes the salient features of the NO/sub i/NO/sub x/ reaction system. The application of the model in predicting the behavior of NO in combustor exhaust flows upon addition of ammonia is presented.

DE82013312 PC **A02**/MF **A01**
Yale Univ., New Haven, CT. Dept. of Chemistry.
Energies of Organic Compounds. Technical Progress Report.
K. B. Wiberg. 19 Feb 81, 25p DOE/ER/04060-T3
Contract AS02-76ER04060

Two automated reaction calorimetry systems were built and tested. The first made use of a quartz thermometer probe as the temperature measuring element. The second was constructed using a thermister which was part of a Wheatstone bridge. The off-balance voltage from the bridge was measured using the 6 1/2 digit digital voltmeter, and transferred to the microprocessor. The one disadvantage of the first system is the relatively large size of the quartz sensor. The calorimeter systems were used to measure: the enthalpies of hydrolysis of ketals, acetal, orthoesters, enthalpies of hydration of alkenes; enthalpies of formation of small ring hydrocarbons.

DE82013453 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Dynamical Studies of Excited States in Triatomic Molecules.
W. K. Liu, D. W. Noid, and M. L. Koszykowski. 1982, 22p CONF-820446-1
Contract W-7405-ENG-26
15. Jerusalem symposium on quantum chemistry and biochemistry, Jerusalem, Israel, 5 Apr 1982.

A numerical study on the spectra of the vibrational motion of the isotopic species of water molecule is performed. At low energy the classical motion is quasi-periodic and the spectra show well resolved lines whose frequencies can be identified with the transition frequencies between vibrational states. As energy is increased, the motion becomes chaotic and the spectra are broadened. The effects of isotopic substitution are investigated. Freezing the bending mode affects the motion considerably. A cross-correlation function is introduced and its spectral features studied. (ERA citation 07:044893)

DE82013939 MF **A01**
Tennessee Univ., Knoxville.
Experiments on Continuum Electron Capture in Atomic Hydrogen and Collisional Interactions of Trapped Ions.
Mar 82, 25p DOE/ER/10512-3
Contract AS05-79ER10512
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The background, scope, and progress made on: (1) experiments designed to test the present theory of

charge exchange to continuum for the case of bare nuclei traversing atomic hydrogen targets, and (2) experiments designed to measure charge exchange reaction rates for less than or equal to 10 eV multiply charged ions in neutral gas targets are described. Also, progress on the development of a hydrogen gas target is detailed. (ERA citation 07:044898)

DE82013968 PC **A02**/MF **A01**
Pennsylvania State Univ., University Park. Dept. of Chemical Engineering.
Study of Crystallite Size and Support Interactions on CO Hydrogenation.
M. A. Vannice. Apr 82, 3p DOE/ER/04463-T2
Contract AS02-77ER04463

The past year and half has been spent primarily adapting a differential scanning calorimeter so that support effects on isothermal heats of adsorption can be measured directly. In addition, we now believe that temperature programmed desorption (TPD) studies can also be conducted with our experimental system. It presently provides flows of Ar, H sub 2 , and CO mixtures thereof, and allows both in situ pretreatment and TPD studies as the desorption endotherm is monitored to follow the desorption process. Initial results for H sub 2 are shown which are consistent with previous reports using different techniques and they illustrate this type of calorimeter has the necessary sensitivity to provide satisfactory data. The most persistent problem has been baseline perturbation due to variations in gas mixtures and gas flow rates through the sample and reference cells. The incorporation of flow controllers from funds external to this program has alleviated the first problem, but additional controllers are needed to minimize the second. The in situ IR system has been upgraded by again using funds external to this study and adding an Apple II Plus computer with floppy disc storage, a TV set, and an printer/plotter along with the necessary software. The IR cell design was modified but had unacceptable air leads. We are now conducting our first set of transient studies on Pt/Al sub 2 O sub 3 and Pt/TiO sub 2 catalysts. (ERA citation 07:041990)

DE82014669 MF **A01**
Brigham Young Univ., Provo, UT. Dept. of Chemical Engineering.
Metal-Support Interactions: Their Effects Upon Adsorption Electronic, and Activity/Selectivity Properties of Cobalt in CO Hydrogenation. Annual Progress Report, May 1, 1981-April 30, 1982.
C. H. Bartholomew, R. Reuel, and J. M. Zowtiak. 30 Apr 82, 56p DOE/ER/10855-1
Contract AC02-81ER10855
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The investigation of cobalt metal-support interactions and their effects upon adsorption and activity/selectivity properties of cobalt is described. The objectives of this research are to (i) determine the effects of cobalt-support interactions on dispersion, oxidation state and adsorption properties of cobalt; (ii) correlate the activity/selectivity properties for hydrocarbon synthesis on cobalt with dispersion, oxidation state and behavior of adsorption of CO and H sub 2 and (iii) measure directly the extent of interaction of various supports with iron and cobalt using Moessbauer Spectroscopy. The proposed work features a comprehensive, quantitative experimental investigation of Co on Al sub 2 O sub 3 , SiO sub 2 , TiO sub 2 , MgO, and carbon supports with careful characterization of the physical and chemical, bulk and surface properties of each catalysts with BET, H sub 2 and CO chemisorption XRD, TEM, ESCA, TPD, and TPR measurements. During the first year of investigation H sub 2 and CO adsorption uptakes and activity/selectivity data were obtained for Co supported on alumina, silica, magnesia, titania and carbon. The results provide evidence that supports and preparation methods can significantly influence adsorption and activity/selectivity properties. For example, Co/TiO sub 2 is significantly more active and more selective for C/sub 6+/ hydrocarbons than Co/Al sub 2 O sub 3 and Co/SiO sub 2 ; Co/carbon produces significantly higher fractions of CO sub 2 and C sub 2 -C sub 3 hydrocarbons than cobalt on Al sub 2 O sub 3 , SiO sub 2 or TiO sub 2 .

DE82015005 PC **A03**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
Characterization of Coal-Derived Liquids and Other Fossil-Fuel-Related Materials Employing Mass Spectrometry. Final Report, September 30, 1976-September 29, 1980.
S. E. Scheppele. May 82, 40p DOE/ET/10589-T1, FE-2537-12
Contract AS01-76ET10589

A document was prepared which assessed the state-of-the art in the mass spectrometric characterization of fossil fuel materials and the relevance of these data to the fossil fuel industry. A Kratos DS50 SM data system was successfully interfaced to a CEC 21-110B mass spectrometer. Communications between the NOVA 3/12 computer in the data system and the OSU central computer were established. A Grant Comparator/Microdensitometer was acquired and made operational. Plans were developed and hardware acquired for interfacing the densitometer to the NOVA 3/12 computer. A quartz direct introduction probe was acquired for the CEC 21-110B. A temperature controller for the probe was acquired and interfaced to the slow speed ADC on the auxiliary board in the data system/mass spectrometer interface. The combined FI/EI source was modified to operate in the FD mode and an apparatus was fabricated for conditioning FD emitters. A CSI supergrater 3 was interfaced to the PE 3920 gas chromatograph. The upgraded facility was used to develop mass spectrometric methods for the characterization of fossil fuel materials and to apply methods to the characterization of these materials. Activities included: (1) initial development of field-ionization mass spectrometry for the characterization of saturated hydrocarbons, (2) computerization of the technique of probe microdistillation/mass spectrometry, (3) initation of the development of a new method for the computer assisted assignment of formulas to ion masses, (4) characterization of neutral fractions from a hydrotreated tarsands oil, and (5) characterization of coal-derived oils and asphaltenes. (ERA citation 07:042136)

N82-29360/6 PC **A02**/MF **A01**
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
The Solubility of Oxygen and Carbon Dioxide in Certain Liquid Organic Compounds of Fluorine and in Emulsions from Them.
I. N. Kuznetsova, and N. S. Gokhman. 1982, 9p NRC/CNR-TT-2022, ISSN-0077-5606
Transl. into English from Probl. Gematol. i Pereliv. Krovi (Leningrad), No. 6, 1981 p 51-54.

The solubility of oxygen and carbon dioxide in a number of organic fluorine compounds at various temperatures is reported. Formulas for calculating the oxygen content of organic fluorine emulsions are presented and the calculated results on the oxygen capacity of the emulsions compared with experimental data from the literature. A nomogram for determining the oxygen content or absorption from emulsions having a perfluoro tributyl amine base is constructed.

N82-29374/7 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY. Lab. of Atomic and Solid State Physics.
Critical Fields of Liquids of Liquid Superconducting Metallic Hydrogen.
J. Jaffe, and N. W. Ashcroft. Jul 82, 14p NASA-CR-169160, MSC-4775
Contract NAG2-159

Liquid metallic hydrogen, in a fully dissociated state, is predicted at certain densities to pass from dirty to clean and from type II to type I superconducting behavior as temperature is lowered.

N82-29375/4 PC **A02**/MF **A01**
California Univ., Davis. Dept. of Physics.
Performing Spectroscopic and Specific Heat Studies of Improper Ferroelectrics.
Final Report.
L. B. Coleman. 1982, 17p NASA-CR-169204, JPL-9950-698
Contract JPL-955734
Prepared for JPL.

The results of infrared measurements on Ni-Br, Cu-Cl, and Fe-I boracite improper ferroelectrics and far infrared measurements of Ni-Br boracite are presented. The boracites have the general formula X3B7O3Y, where X = divalent metal and Y = halogen. They undergo a first order phase transition from a high temperature paraelectric phase with cubic symmetry to a ferroelectric phase with orthorhombic symmetry. The boracites are 'improper ferroelectrics' since the spontaneous polarization is not the primary order parameter in the cubic-orthorhombic phase transition. Current understanding of these materials is that the primary order parameter is associated with a doubly degenerate zone-boundary phonon in the cubic phase. The degerate critical modes become homogeneous and split into the A sub 1 and A sub 2 modes in the orthorhombic phase, doubling the volume of the primitive cell. An harmonic coupling between the softing A sub 1 and a low frequency A sub 1 optic mode induces a spontaneous polarization as a secondary effect in the ferroelectric phase. This secondary non-critical nature of the ferroelectric mode earns these materials the 'improper' title and is responsible for their unique properties and high figure of merit in detector use.

N82-29386/1 PC **A05**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Reaktorbauelemente.
Experimental Investigation About the Kinetics of Sulfur Trioxide-Splitting.
Thesis.
E. Savvidis. Aug 80, 100p DE82-902153, JUEL-1669
In German; English Summary.

The splitting of the SO3 (SO3 reversible SO2 + 1/2 O2) is the key reaction of the thermochemical cycle process of the sulfuric acid group. Experiments were carried out in a streaming tube which was used as a differential reactor. The homogeneous and the heterogeneous catalytic reactions were investigated in the temperature range between 750 to 950 C and the pressure range between 1 to 37 bars. The evaluation of the results is made using the exponential, Hinshelwood and porous model. The basic calculations for the lay-out of the SO3-splitting reactors are presented.

N82-29397/8 PC **A02**/MF **A01**
Strasbourg-1 Univ. (France). Centre de Recherches Nucleaires.
Argon Luminescence Bands Between 1600 A and 2900 A.
G. Klein, and M. J. Carvalho. 1980, 19p DE81-700817, CRN-CPR-80-17

It is proposed that the luminescence bands observed in high pressure argon between 1600 A and 2900 A are due to transitions involving excited states, Ar2( ), of the molecular ion, Ar2( ): the initial state is a bound state having a (2)S-(2)S0 ion-atom asymptote and the final states two of the first set of molecular ion states which dissociate to the ion-atom pair (2)P-(1)S0. This assumption accounts for most known experimental data on this emission bands. The competition between the radiative transitions and the quenching collisions between the excited-ions and electrons in (-) particle tracks has been studied experimentally and is discussed in terms of the present hypothesis. A comparison is also made between the neutralization of excited and ground state molecular ions.

N82-30061/7 PC **A02**/MF **A01**
Flinders Univ. of South Australia, Bedford Park. Inst. for Atomic Studies.
Polarization Potential for Intermediate Energy Electron-Atom Scattering.
I. E. Mccarthy, B. C. Saha, and A. T. Stelbovics. Dec 80, 8p DE81-700821, FIAS-R-73

The adiabatic approximation to the effective electron-atom potential gives an asymptotic form (-)r(+4), where (-) is the static polarizability. It is shown that intermediate and high energies, where this approximation is invalid, (-) is replaced by an oscillatory, energy dependent coefficient.

N82-30062/5 PC **A02**/MF **A01**
Flinders Univ. of South Australia, Bedford Park. Inst. for Atomic Studies.
Analytic Approximations for Integrated Electron-Atom Excitations.
I. E. Mccarthy, B. C. Saha, and A. T. Stelbovics. Sep 80, 22p DE81-700820, FIAS-R-70
Sponsored in Part by the Australian Inst. For Nuclear Science and Engineering and the Australian Research Grants Committee.

Accurate calculations of atomic excitations require estimates of the effect of higher excitation on the effective (optical) potential coupling various reaction channels. The total cross section for a particular excitation is proportional to the maximum contributin of that excitation to the imaginary part of the elastic momentum-space optical potential, and is typical of the contribu-

tion to the potential in general. Analytic expressions relevant to the calculation of optical potentials are given. Their validity is estimated by comparison with more-accurate calculations and with experimental excitation cross sections.

N82-30201/9 PC **A02**/MF **A01**
Ohio State Univ., Columbus. Dept. of Physics.
Nitrogen, Oxygen and Air Broadened Widths and Relative Intensities of N2O Lines Near 2450/cm.
R. L. Hawkins. 1982, 17p NASA-CR-169155, NAS 1.26:169155
Grant NSG-7469

Spectra of the v sub 1 + 2v sub 2 and the weak underlying v sub 1 + 3v sub 2 - v sub 2 band of N2O near 2450/cm were analyzed by the nonlinear, least squares, whole band technique. The oxygen, nitrogen, and air broadened line widths and the relative line intensities were determined. The air broadened widths, for/m/3, are in agreement with those in the 1980 AFGL line listing and the relative band intensities also agree, within about 20% with the values in this listing.

PAT-APPL-6-254 318 PC **A02**
Department of the Interior, Washington, DC.
A Catalytic Coating to Directly Generate Heat Upon the Surface of a Heat Dome.
Patent Application,
John L. Hoke, and Theodore W. Sudia. Filed 15 Apr 81, 14p PB82-257940
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

The use of a catalytic coating which acts to combine both the heat source and heat-transfer mechanism for a working fluid, such as that used in an external combustion engine. Maximum heat exchange is accomplished by the direct bonding of the coating, per se, to the engine head with a compound of catalytic agents which confines heat of combustion directly thereto. The preferred embodiment of the engine head surface may be finned or otherwise enlarged to provide for an increased surface area necessary for the heating of the engine head. This means of surface combustion results in a highly fuel-efficient engine and/or heat source with very low exhaust pollutants.

PB82-259458 PC **A03**/MF **A01**
Tsukuba Univ., Ibaraki (Japan). Inst. of Information Sciences and Electronics.
A Graph Database for Storage of Chemical Structures Organized by BCT,
Yuzuru Fujiwara, and Takashi Nakayama. 22 Jul 81, 29p ISE-TR-81-20
Prepared in cooperation with Kuraray Co. Ltd., Okayama (Japan). Central Research Lab.

A method is presented for organizing a graph database, which is based on the representation of chemical structures in terms of BCT (block-cutpoint tree). It is useful for quick substructure search, for saving memory as well as for convinience in structure generation. The database consists of four files: a master file, a bit sequence file of fixed length records which gives block components of compounds, a BCT file which gives the BCT-structures of compounds, and a block file which specifies the blocks. These files are organized recursively and hierarchically, which makes it easy to process structural information of compounds.

PB82-259862 PC **A03**/MF **A01**
Institute of Physical and Chemical Research, Saitama (Japan).
Scientific Papers of the Institute of Physical and Chemical Research, Volume 75, Number 3, September 1981.
Quarterly rept.,
Rikagaku Kenkyusho. Sep 81, 34p PAPER-1935
Also pub. in ISSN-0020-3092.

Contents:
- A pi-electron model for the lowest singlet excited states of acetylene;
- Note on the catalysis of cyclopentadienylcobalt (C5H5Co) in olygomerization of acetylene to form cyclopentadienylcobaltacyclopentadiene (eta sup 5-C5H5CoC4H4) and bis (acetylene) cobalt (eta sup 5-C5H5Co(eta sup 2-C2H2)2) as an intermediate;
- Ammonia synthesis at low pressures.

PB82-260464 PC **A05**/MF **A01**
Bureau of Mines, Albany, OR. Albany Research Center.
Thermodynamic Data for Arsenic Sulfide Reactions.
Rept. of investigations/1982,
A. D. Mah. Jul 82, 93p BUMINES-RI-8671
Library of Congress catalog card no. 82-600063.

Thermodynamic data on compounds of arsenic and sulfur were critically evaluated by the Bureau of Mines. Changes of standard enthalpy and Gibbs energy, and logarithms of the equilibrium constants were tabulated as a function of temperature for reactions involving these compounds.

PB82-261306 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
DTA Results for a Number of Organic Phase Change Materials,
Interim rept.,
R. Banen, and C. J. Hoogendoorn. Dec 81, 31p

Part of this project consists of laboratory testing on the thermal behavior of different organic materials suitable for use as PCM (phase change materials) for heat storage. These tests were done using a DTA microcalorimeter as developed by the Institute of Applied Physics in Delft. This calorimeter is based on the continuous measurement of the heat transferred through a heat flow meter to a sample of PCM. With this device it is possible to measure the solidification and melting range, the latent heat and the specific heat (in the solid and the liquid phase). As part of the project 'Thermal energy storage system using organic phase-change materials with improved thermal conductivities for storage temperatures between 35 and 120C' research has been and still is being done on the thermal properties of a number of organic compounds which can be used as phase-change materials in the temperature range of 30-95C.

PB82-261413 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Dept. of Chemical Engineering.
Mathematical Model for Multicomponent Aerosol Formation and Growth in Plumes.
Journal article,
Mark Bassett, Fred Gelbard, and John H. Seinfeld. 21 Jan 81, 14p EPA-600/J-81-581
Grant EPA-806844
Pub. in Jnl. of Atmospheric Environment, v15 n10/11 p2395-2406 1981.

Description of the evolution of the size and chemical composition of aerosols in plumes is fundamental to the ability to predict visibility impairment. Previously, it has only been possible to predict changes in aerosol size distributions in plumes. In this work the first model for predicting both size and chemical composition evolution of plume aerosols is presented. Coagulation, homogeneous particle formation, heterogeneous condensation, and particle phase chemical equilibria and kinetics are explicitly included. The model is based on a sectional representation of the size-composition spectrum and computation is easy to implement. This model holds promise to be a standard component of all plume visibility calculations that require plume aerosol size and composition information.

PB82-261470 Not available NTIS
National Bureau of Standards, Washington, DC.
Structure and Orientation of NH3 on Clean and Oxygen-Precovered Al(111).
Final rept.,
Falko P. Netzer, and Theodore E. Madey. May 82, 6p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Chemical Physics Letters 88, n3 p315-320, 7 May 82.

On clean Al(111) bonding of molecular NH3 occurs via the N atom with a wide distribution of tilt angles of the molecular axis with respect to the surface normal and with random azimuthal orientation. Fractional monolayers of chemisorbed oxygen induce a high degree of local azimuthal orientation of the H atoms in adsorbed NH3, in the absence of long range order. Azimuthal orientation and increased bonding strength of NH3 on the oxygen-covered surface are associated with hydrogen-bonding interactions within the coadsorbed layer.

PB82-261512 Not available NTIS
National Bureau of Standards, Washington, DC.
Numerical Evaluation of the Dielectric Polarization Distribution from Thermal-Pulse Data.
Final rept.,
F. I. Mopsik, and A. S. DeReggi. Jun 82, 7p
Sponsored in part by Office of Naval Research, Arlington, VA.
Pub. in Jnl. of Applied Physics 53, n6 p4333-4339 Jun 82.

A method for numerically carrying out the Fourier analysis for the thermal-pulse experiment is given. It is shown that it is possible to obtain the polarization distribution across the thickness of a thin film (25 micrometers) to within the limits set by the experimental data. For such films, resolution of the distribution to within 0.1 of the film thickness is possible. Results are given for the experiment by using a charge measurement rather than a voltage measurement. The effect of a finite-width pulse is shown to cut off the Fourier coefficients in such a way as to smooth any distribution. Pulsing the sample alternately on both sides is shown to greatly increase the resolution of the experiment. Results for a PVF2 film and a P(VF2-TFE) copolymer film show that interesting details can be found by the experiment.

PB82-261520 Not available NTIS
National Bureau of Standards, Washington, DC.
Photoelectron-Photoion Coincidence Spectroscopy of Gas-Phase Clusters.
Final rept.,
E. D. Poliakoff, P. M. Dehmer, J. L. Dehmer, and R. Stockbauer. Jun 82, 11p
Sponsored in part by Department of Energy, Washington, DC., and Office of Naval Research, Arlington, VA.
Pub. in Jnl. of Chemical Physics 76, n11 p5214-5224, 1 Jun 82.

A photoelectron-photoion coincidence technique for obtaining the photoelectron spectrum of a single component of a gas-phase mixture has been developed. It utilizes a newly designed instrument which measures the ion mass in coincidence with the photoelectron kinetic energy. Initial experiments were carried out on Xe2 and Xe3 produced in a mixture of clusters (plus monomer) in a free-jet supersonic expansion.

PB82-261538 Not available NTIS
National Bureau of Standards, Washington, DC.
Spectra of the Cobaltlike Ions Sr XII, Y XIII, Zr XIV, Nb XV, and Mo XVI.
Final rept.,
Aleksandr N. Ryabtsev, and Joseph Reader. Jun 82, 7p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of the Optical Society of America 72, n6 p710-716 Jun 82.

Spectra of the cobaltlike ions Sr XII, Y XIII, Zr XIV, Nb XV, and Mo XVI have been observed by means of a low-inductance vacuum spark and a 10.7-m grazing incidence spectrograph in the region 40-95 A.

PB82-261561 Not available NTIS
National Bureau of Standards, Washington, DC.
A Review of Halocarbon and Halogen Adsorption with Particular Reference to Iron Surfaces.
Final rept.,
M. Grunze, and P. A. Dowben. 1982, 31p
Sponsored in part by IBM Research Lab., San Jose, CA.
Pub. in Applications of Surface Science 10, p209-239 1982.

In this communication, a comprehensive review on halocarbon adsorption on solid surface is presented. The physical and chemical properties of surfaces, for which adsorbed halocarbons readily dissociate, are dominated by the respective halogens; hence, the published data on halogen adsorption are also presented in a tabulated form. A complete reference list on halogen overlayers is provided. The adsorption of halocarbons is discussed with reference to their surface chemistry while technological as well as some environmental aspects are also mentioned. The available results are discussed according to the substrate surfaces used. In general, one can distinguish between substrates where some halocarbons adsorb without complete

fragmentation and those surfaces where the halocarbons dissociate completely and the atomic fragments remain adsorbed or absorb in the selvedge.

PB82-261579 Not available NTIS
National Bureau of Standards, Washington, DC.
Disorders in the Crystal Structures of Homo- and Copolymers of Polytetrafluoroethiyene.
Final rept.,
R. K. Eby. Jul 82, 1p
Pub. in Preceedings of Int. Union of Pure and Applied Chemistry--28th Macromolecular Symp., Amherst, MA, July 13, 1982, p592.

The phase diagram of polytetrafluoroethylene and some copolymers of tetrafluoroethylene with hexafluoropropylene exhibits four solid crystal phases (1). The effect of comonomer units on these have been investigated by x-ray diffraction techniques.

PB82-261603 Not available NTIS
National Bureau of Standards, Washington, DC.
Monte Carlo Calculation of SANS for Various Models of Semi-Crystalline Polyethylene.
Final rept.,
Charles M. Guttman, J. D. Hoffman, and E. A. DiMarzio. 1979, 13p
Pub. in Faraday Discussions of the Chemical Society 68, p297-309 1979.

Small angle neutron scattering (SANS) of semi-crystalline polyethylene is computed using a Monte Carlo technique similar to that used by Yoon and Flory. Models of polymer chains with substantial amounts of chain folding (with a probability of adjacent re-entry of 0.6 to 0.8) are shown to give the following: (1) proper density in the crystalline and amorphous regions, (2) the experimentally obtained radius of gyration, (3) scattering close to the experimentally obtained scattering. While SANS alone cannot decisively distinguish between the Yoon and Flory 'switchboard' model and models with folds, present indications are that only models with a substantial amount of folding satisfactorily meet all conditions (1-3). The 'switchboard' model used by Yoon and Flory to explain the SANS of semi-crystalline polyethylene is shown not to meet criteria (1) above.

PB82-261611 Not available NTIS
National Bureau of Standards, Washington, DC.
Calculation of SANS Intensity for Polyethylene: Effects of Varying Fold Planes and Fold Plane Roughening.
Final rept.,
Charles M. Guttman, Edward A. DiMarzio, and John D. Hoffman. May 81, 12p
Pub. in Polymer 22, p597-608 May 81.

The intensity of the small angle neutron scattering (SANS) for polyethylene crystallized in the lamellar habit from the melt at large supercoolings is calculated for mu = 0.01 to mu = 0.14 (mu = (4 pi/lambda) sin (theta/2)). Computations are made on models which allow various amounts and types of chain folding and varying degrees of 'tight' or 'regular' folds. The models that fit the SANS data best have folding along lattice plans in which the stem separation is larger than 5 A or which allow for fold plane roughening on a variety of fold planes. The best models fit not only the SANS data, but also simultaneously the liquid and crystal density, degree of crystallinity, and characteristic ratio (or radius of gyration).

PB82-261629 Not available NTIS
National Bureau of Standards, Washington, DC.
Modeling the Amorphous Phase and the Fold Surface of a Semicrystalline Polymer - The 'Gambler's Ruin' Method.
Final rept.,
Charles M. Guttman, Edmund A. DiMarzio, and John D. Hoffman. Nov 81, 14p
Pub. in Polymer 22, p1466-1479 Nov 81.

A semicrystalline polymer with lamellar morphology consists of alternating amorphous and crystalline regions; if sufficiently long, each molecule in this system traverses both the crystalline and amorphous zones. The amorphous portion is comprised of portions of a molecule that form loops that re-enter the same lamella at some distance from the point of emergence, and bridges that form connections between two different crystal lamellae. (A tight fold is not considered to be a loop.) The statistics of loops and bridges are shown to be identical to the classical 'Gamblers Ruin' problem in Mathematical Statistics. This is a useful observation because the extensive existing literature on the Gamblers Ruin Problem allows us to immediately transcribe results to the polymer problem. Using this approach the ratio of the number of loops to the number of bridges is determined to be M, where M is the plate separation (i.e., the thickness of the amorphous zone) is unit statistical steps. Also, the average number of steps comprising the amorphous run is determined to be 3M + 1 for a simple cubic lattice in three dimensions. This modeling leads to a calculation of the minimal fraction of crystal stems involved in tight folding in a semicrystalline polymer. For a simple cubic lattice this is found to be 2/3. The effects of crystal structure and stiffness of the chain in the melt on this bound are discussed.

PB82-261637 Not available NTIS
National Bureau of Standards, Washington, DC.
The Role of Reputation in the Rate of Crystallization of Polyethylene Fractions from the Melt.
Final rept.,
John D. Hoffman. May 82, 15p
Pub. in Polymer 23, p656-670 May 82.

The theory of polymer crystallization with chain folding is extended to include the effect of reputation in the melt on the rate of crystallization GI and GII in Regimes I and II. The result is that the pre-exponential factors for GI and GII contain a factor 1/n, where n is the number of monomer units in the pendant chain being reeled onto the substrate by the force of crystallization; n is proportional to the molecular weight. The data analysis on the fractions confirms the detailed applicability of Regime theory. The growth rate theory presented allows the possibility that the growth front may be microfaceted in Regime I.

PB82-261678 Not available NTIS
National Bureau of Standards, Washington, DC.
Determination of Molecular Constants from Collision-Induced Infrared Spectra and Related Methods.
Final rept.,
George Birnbaum. 1980, 35p
Pub. in Intermolecular Spectroscopy and Dynamical Properties of Dense Systems LXXV, p111-145 1980.

This paper describes how quantitative information on molecular parameters, particularly the electric multipole moments, can be obtained from collision-induced absorption spectra. Also discussed are related methods based on the second dielectric virial coefficient and birefringence induced by an externally applied electric field.

PB82-261850 Not available NTIS
National Bureau of Standards, Washington, DC.
Electron-Hole Pairs, Molecular Vibrations, and Rate Processes at Metal Surfaces.
Final rept.,
J. W. Gadzuk, and Horia Metiu. 1982, 22p
Pub. in Vibrations at Surfaces, p519-540 1982.

Consequences of the coupling of nuclear motion of an atom or molecule near a metal surface with the electron-hole pair excitations of the metal are considered from the point of view of vibrational spectroscopy. Special emphasis is placed on the interrelationship between pair excitation, surface localized vibrational structure, and rate processes. Specific realizations discussed here in terms of vibrational spectroscopy include: Pair renormalization of intramolecular vibrational modes; Desorption rates; Pair excitation, trajectory theories, and vibrational modes; and Reaction rate theory at surfaces.

PB82-261884 Not available NTIS
National Bureau of Standards, Washington, DC.
A Deformation Analysis of a Polyethylene Crystal Subjected to End Forces of Stretching and Lattice Expansion.
Final rept.,
Jeffrey T. Fong. Sep 80, 6p
Pub. in Proceedings of International Congress on Rheology (8th), Naples, Italy, September 1980, p287-292.

In a recent paper by Hoffman (Polymer, 20 1071-1077 (1979)) on the formation of polymer fibrils by flow-induced crystallization, several assumptions were made in deriving a suitable form of the end surface free energy of a typical crystallite. One of the assumptions was an assertion that the deformation within the crystal as its end surfaces underwent stretching and biaxial expansion, would be approximately uniform. In this paper, a deformation analysis of an idealized square parallelepiped under the combined action of two types of end forces, namely, stretching and lattice-expansion, is performed to assess the validity of the uniform deformation assumption. Taking advantage of the symmetry of the problem and applying the classical solution of a beam on elastic foundation due to Hetenyi (1936, 1946) and Timoshenko (1956), a general result on the ratio of the displacements at the end and the center of the crystal along its line of symmetry can be expressed in terms of the aspect ratio of the crystal, the degree of anisotropy, and the longitudinal strain in the crystal due to stretching. For polyethylene fibril crystal of aspect ratio equal to 6, anisotropy ratio equal to .003, and a longitudinal strain of 3.6% (maximum to break), the assumption of a uniform deformation throughout the crystal is found to be reasonable as a first approximation.

PB82-261900 Not available NTIS
National Bureau of Standards, Washington, DC.
Theory of Collision-Induced Line Shapes - Absorption and Light Scattering at Low Density.
Final rept.,
G. Birnbaum, B. Guillot, and S. Bratos. 1982, 64p
Pub. in Adv. Chem. Phys. 51, p49-112 1982.

The great emphasis given to line shape calculations in collision-induced absorption (CIA) and collision-induced light scattering (CILS) has produced an amazing variety of results exploring, it would seem, almost every nuance of the subject. In one of the first calculations based on eliminating the potential, which produced a shape in very good agreement with experiment, the conclusion was reached that collision-induced line shapes may be rather insensitive to the form of the potential function. This conclusion has been strengthened by many subsequent investigations. But this is not to say, however, that studies of collision-induced shapes cannot yield information regarding the potential function. Since the absolute line shape is much more sensitive to the induction model than the potential function, line shape calculations are very useful for investigating the form of the induction function provided one uses the best potential functions that are available. Since, however, the 'best' potential for describing n phenomena may not necessarily be the best for the n+1st, the authors recommend that future attempts to parametrize potential models might be aided by including collision-induced spectral data.

PB82-262262 PC **A10/MF A01**
Environmental Research and Technology, Inc., Westlake Village, CA.
Secondary Organic Aerosol Formation: Homogeneous and Heterogeneous Chemical Pathways.
Final rept.,
Daniel Grosjean, and Peter H. McMurry. Mar 82, 211p ERT/P-A098-09, CRC-APRAC-CAPA-20-80

This report describes the results of the first phase of a research project directed at elucidating the homogeneous and heterogeneous pathways governing the formation of secondary aerosols in polluted atmospheres. Using Environmental Research and Technology's outdoor environmental chamber facility, experimental studies were conducted for model systems representative of both homogeneous and heterogeneous interactions. Homogeneous pathways, for which some information already exists, were investigated in detail for precursor hydrocarbons not studied before. Aerosol formation rates were measured for all systems. Studies of heterogeneous systems, for which virtually no information is available, were exploratory in nature.

PB82-263948 Not available NTIS
National Bureau of Standards, Washington, DC.
An Exact X-ray Edge Model for Non-adiabatic Scattering from Metal Surfaces.
Final rept.,
J. W. Gadzuk. 15 Aug 81, 6p
Pub. in Physical Review B 24, n4 p1866-1871, 15 Aug 81.

One implication of the Anderson Orthogonality Theorem is that a particle cannot elastically scatter from a metallic surface with unit probability. A simple, but exactly soluble model (within the usual bonds of X-ray edgeology) is presented which enables transparent and analytic calculation of the no-loss line intensity. Comparison between the dynamic properties of the

scattering event and the static properties of the coupled substrate particle system are made.

PB82-263963 Not available NTIS
National Bureau of Standards, Washington, DC.
Double Resonant Charge Exchange in Ion-Ion Collisions.
Final rept.,
R. K. Janey, and D. S. Belic. 10 May 82, 3p
Pub. in Physics Letters 89A, n4 p190-192, 10 May 82.

The process of resonant double charge exchange in low energy ion-ion collisions is considered. The effects of the Coulomb interaction of the nuclei are taken into account. Cross section calculations are performed both for completely and partially stripped projectile ions with 3 less than or equal to Z less than or equal to 10.

PB82-264037 Not available NTIS
National Bureau of Standards, Washington, DC.
Rotational Isomeric Modeling of a Polyethylene-Like Polymer between Two Plates - Connection to Gambler's Ruin Problem.
Final rept.,
Charles M. Guttman, Edmund A. DiMarzio, and John D. Hoffman. Apr 82, 7p
Pub. in Macromolecules 15, n2 p525-531, Mar-Apr 82.

Monte Carlo simulation of the rotational isomeric state model of a polyethylene-like polymer chain has been performed for the polymer between two plates with absorbing boundary conditions. Calculations using Flory's real chain parameters for a polyethylene chain give a density for the amorphous phase of 2.5 gm/cm for a switchboard model of polyethylene when the density of the crystal is assumed to be one. This amorphous density is 2.8 times the measured density of the melt of polyethylene showing the unreality of the switchboard model. The Monte Carlo results show that the simple concept of statistical length appropriate to unconfined polymers is also appropriate to bulk polymer chains that are confined by plane surfaces. Thus, as suggested previously Gambler's Ruin Methods used to obtain quantities such as the length of a run, the length of a loop or tie, and the probability of a loop or tie are valid for stiff chains if the statistical length is used as the fundamental step length.

PB82-264045 Not available NTIS
National Bureau of Standards, Washington, DC.
Hydrogen Exchange in RNase A: Neutron Diffraction Study.
Final rept.,
Alexander Wlodawer, and Lennart Sjoelin. Mar 82, 5p
Pub. in Proceedings of the National Academy of Science 79, p1418-1422 Mar 82.

Hydrogen exchange has been studied in a single crystal of RNase A (ribonuclease (pancreatic), EC 3.1.27.5) in the course of a neutron structure investigation. Refinement of the occupancies of amide hydrogens provided information about the kind of isotope present in each site and also provided estimates of the errors associated with the measurement.

PB82-264052 Not available NTIS
National Bureau of Standards, Washington, DC.
A Procedure for Joint Refinement of Macromolecular Structures with X-ray and Neutron Diffraction Data from Single Crystals.
Final rept.,
Alexander Wlodawer, and Wayne A. Hendrickson. 1982, 5p
Pub. in Acta Crystallographica A38, p239-247 1982.

A procedure is presented for the stereochemically restrained least-squares refinement of macromolecular structures with neutron and X-ray diffraction data from single crystals. This procedure has been tested by refining a model of ribonuclease A using neutron data to minimal spacings of 2.8 A and X-ray data from within 2.0 A spacings. Joint X-ray and neutron refinement is well conditioned and tends to avoid false minima that may occur when a medium -resolution structure is refined solely with the neutron structure factors.

PB82-264094 Not available NTIS
National Bureau of Standards, Washington, DC.
High Order Asymptotic Expansions of the Four Kernel Functions for Line Formation with the Voigt Profiles.
Final rept.,
D. G. Hummer. 1982, 5p
Grant NSF-AST80-19874
Pub. in Jnl. of Quantitative Spectroscopy and Radiative Transfer 27, n6 p569-573 1982.

Analytical expressions are given for the coefficients, as a function of the Voigt parameter a, in the asymptotic expansions of the kernel functions K1(tau), K2(tau), M1(tau), and M2(tau) that describe the transfer of radiation scattered with complete redistribution over a Voigt profile.

PB82-264102 Not available NTIS
National Bureau of Standards, Washington, DC.
A Soluble Relaxation Model for Core Level Spectroscopy on Adsorbed Atoms.
Final rept.,
J. W. Gadzuk, and S. Doniach. 1978, 22p
Sponsored in part by Army Research Office, Durham. NC.
Pub. in Surface Science 77, p427-448 1978.

The photoelectron spectrum of core levels in adsorbed atoms is calculated taking into account the screening of the core hole due to both displaced surface plasmons (image charges) and actual transfer of screening charge into the lowest unfilled valence levels of the adsorbate. The theory is detailed on a simplified but exactly soluble model, permitting parametric numerical studies of the spectrum while maintaining close contact with physical understanding. Recent theory on adsorbate relaxation effects due to Gumhalter and Newns, Gunnarsson and Schonhammer, Lang and Williams, and others are considered in the light of this model.

PB82-264110 Not available NTIS
National Bureau of Standards, Washington, DC.
The Origin of H+ in Electron Stimulated Desorption of Condensed CH3OH.
Final rept.,
R. Stockbauer, E. Bertel, and T. E. Madey. 1 Jun 82, 3p
Pub. in Jnl. of Chemical Physics 76, n11 p5639-5641, Jun 82.

Using deuterium labelling (CH3OD and CD3OH) it was determined that H(+1) in electron stimulated desorption (ESD) from condensed methanol multilayers is removed from the carbon rather than the oxygen atom. The peak in the ion kinetic energy distributions shifted toward lower energy as the energy of the incident electron was lowered consistent with the Franck-Condon model of ESD. The effects of hydrogen bonding on the desorbed ion mass spectra are discussed.

PB82-264144 Not available NTIS
National Bureau of Standards, Washington, DC.
Observations of Pre- and Post-Breakdown Events in Polydimethylsiloxanes.
Final rept.,
E. F. Kelley, R. E. Hebner, Jr., E. O. Forster, and G. J. Fitzpatrick. Jun 82, 4p
Proceedings of Conference 1982 IEEE Int. Symposium on Electrical Insulation, Philadelphia, PA, June 7-9, 1982, p255-258 Jun 82.

The effect of viscosity and rate of voltage application on the electrical breakdown process in four polydimethylsiloxane fluids has been investigated under non-uniform field conditions using a high-speed image converter camera.

PB82-264193 Not available NTIS
National Bureau of Standards, Washington, DC.
The Application of High Performance Liquid Chromatography Coupled to a Graphite Furnace Atomic Absorption Detector for Speciation of Inorganic and Organic Arsenic Compounds in Oil Shale Process Waters.
Final rept.,
Richard H. Fish, J. P. Fox, F. E. Brinckman, and K. J. Jewett. Mar 82, 6p
Pub. in Environmental Science and Technology 16, n3 p174-179 Mar 82.

Oil shale retorting produces a number of wastes that can reach the environment through direct discharge or accidental spills. In situ pyrolysis processes result in quantities of shale oil plus water, the latter component providing a leaching vehicle for transport of toxic organics, trace metals, and organometals. The purpose of this program is to identify and quantify the organometallic and inorganic species present in various components of the oil shale retorting process: process waters, oils, solid wastes, and aquatic leachates. In collaboration with the Chemical and Biodegradation Processes Group, Center for Materials Science, National Bureau of Standards, a method for direct, element-selective speciation of one known toxic component of process waters has been demonstrated. For a variety of process waters from different sources, trace (ppm) quantities of inorganic (arsenate), methylarsonic acid, and phenylarsonic acids species have been observed. Possible 'fingerprint' patterns are seen with certain water samples which suggest future lines of investigation for arsenic as well as many other trace organometallic systems detectable by HPLC-GFAA.

PB82-264284 Not available NTIS
National Bureau of Standards, Washington, DC.
Spectrum and Energy Levels of Triply Ionized Yttrium (Y IV).
Final rept.,
Gabriel Epstein, and Joseph Reader. Apr 82, 17p
Pub. in Jnl. of the Optical Society of America 72, n4 p476-492 Apr 82.

The spectrum of Y IV was observed in the region from 300 to 5000 A with the 10.7-m normal incidence vacuum spectrograph and the 10.7-m Eagle spectrograph in air at the National Bureau of Standards.

PB82-264300 Not available NTIS
National Bureau of Standards, Washington, DC.
Fluctuation Expressions for Fast Thermal Transport Processes: Vortex Viscosity.
Final rept.,
Denis J. Evans, and H. J. M. Hanley. Mar 82, 4p
Pub. in Physical Review A 25, n3 p1771-1774 Mar 82.

The vortex viscosity of a model diatomic fluid is calculated using both equilibrium and nonequilibrium molecular dynamics. The two calculations agree within statistical uncertainties. The results show that vortex viscosity does not have a conventional Kubo-Green relation. An argument as to why this is so is presented.

PB82-264318 Not available NTIS
National Bureau of Standards, Washington, DC.
Distortion of the Structure of a Simple Fluid.
Final rept.,
S. Hess, and H. J. M. Hanley. Mar 82, 5p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Physical Review A 25, n3 p1801-1804 Mar 82.

The distortion of the structure of a simple fluid of spherical particles when subjected to a shear is analyzed. The orientational distribution of particles around a central particle is examined via the radial distribution function. General symmetry arguments are advanced. Computer simulation results using the technique of homogeneous shear nonequilibrium molecular dynamics are reported for the inverse-12 soft sphere system. It is shown that the fluid displays nonNewtonian behavior.

PB82-264342 Not available NTIS
National Bureau of Standards, Washington, DC.
Activity and Osmotic Coefficients of Aqueous Nickel (II) Nitrate Solutions.
Final rept.,
M. Sarbar, A. K. Covington, R. L. Nuttall, and R. N. Goldberg. 1982, 9p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of Chemical Thermodynamics 14, p537-545 1982.

The osmotic coefficients of aqueous nickel (II) nitrate have been measured at 298.15 K by the isopiestic method at molalities ranging from 0.052 to 5.5 mol/kg. The measured osmotic coefficients were used to calculate activity coefficients using four different correlating equations. Error estimates and comparisons with previous literature values are given.

PB82-264359 Not available NTIS
National Bureau of Standards, Washington, DC.
Activity and Osmotic Coefficients of Aqueous Potassium Carbonate.
Final rept.,
M. Sarbar, A. K. Covington, R. L. Nuttall, and R. N. Goldberg. 1982, 8p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Jnl. of Chemical Thermodynamics 14, p695-702 1982.

The isopiestic method has been used to determine the osmotic coefficients of aqueous potassium carbonate at molalities ranging from 0.13 to 8.1 mol/kg at 298.15 K. The solubility has been measured both by the isopiestic method and by titration of the saturated solution with hydrochloric acid and is (8.102 + 0.008)mol/kg. The measured osmotic coefficients were used to calculate activity coefficients using four different correlating equations. The authors give an error estimate and a comparison with previous literature results.

PB82-264409 Not available NTIS
National Bureau of Standards, Washington, DC.
Equation of State of Ethylene Vapor Between 223 and 273 K by the Burnett Method.
Final rept.,
J. M. H. Levelt Sengers, and J. R. Hastings. Sep 81, 20p
Pub. in Int. Jnl. of Thermophysics 2, n3 p 269-288 Sep 81.

Measurements are reported of the equation of state of ethylene in the vapor phase between 223 and 273 K by the Burnett method. (P, rho, T) values are reported on six isotherms at 10 K intervals. Virial coefficients have been obtained in this range both for ethylene and for helium. The Burnett isotherms were coupled isochorically, revealing a small but noticeable adsorption effect. Isochoric intersections with the phase boundary were performed, resulting in values for the vapor pressure and the vapor density. Again, clear indications of surface effects were found. The results have been compared with recent work by Douslin and Harrison, and by Thomas and Zander. The agreement with the work of Douslin and Harrison is striking; better than 2 parts in 10,000 in pressure and than 1 cc/mol in the second virial coefficient. The agreement with the McCarty - Jacobsen formulation is somewhat less satisfactory. A discussion of the various factors determining the reliability of the results is given.

PB82-264425 Not available NTIS
National Bureau of Standards, Washington, DC.
Prediction of Dense Fluid Viscosities in Hydrocarbon Mixtures.
Final rept.,
James F. Ely. 1982, 9p
Contract NASA-C-60875
Sponsored in part by Gas Research Inst., Chicago, IL.
Pub. in Proceedings of Gas Processors Association Annual Convention (61st), Dallas, TX. March 15-17, 1982, p9-17 1982.

Recently, Ely and Hanley (Ind. Eng. Chem. Fundam. 20, 323, 1981) have proposed a corresponding states model for the prediction of the viscosity and thermal conductivity of hydrocarbon mixtures. The model, which is the basis for the computer program TRAPP which is currently distributed by the Gas Processors Association, uses a methane reference fluid with corrections for noncorrespondence and size difference effects in mixtures. This manuscript reports the preliminary results of some recent modifications which have been made to the corresponding states model in an effort to improve its predictions. In particular, a propane reference fluid has been adopted and a correction for size and mass difference effects in the mixture viscosity coefficient based on the Enskog theory for hard spheres has been developed. Comparisons of the predictions of the revised model with experimental data for both pure fluid and mixture viscosity are presented.

PB82-264441 Not available NTIS
National Bureau of Standards, Washington, DC.
Radiance Temperature (at 653 nm) of Tungsten at its Melting Point.
Final rept.,
A. Cezairliyan, and A. P. Miller. 1982, 11p
Sponsored in part by Air Force Office of Scientific Research, Bolling AFB, DC.
Pub. in Int. Jnl. of Thermophysics 3, n1 p89-99 1982.

The radiance temperature (653 nm) of tungsten at its melting point was measured using a subsecond-duration pulse-heating technique. Specimens in the form of strips with initially different surface roughnesses were used. The results do not indicate any dependence of radiance temperature (at the melting point) on initial surface or system operational conditions. The average radiance temperature (at 653 nm) at the melting point for 23 specimens is 3208 K on IPTS-68 with a standard deviation of 0.8 K and a maximum absolute deviation of 1.9 K. The total error in the radiance temperature is estimated to be not more than + or - 10 K.

PB82-265638 Not available NTIS
National Bureau of Standards, Washington, DC.
Direct Observation of Hot-Electron Spectra from Laser-Excited Sodium Vapor.
Final rept.,
J. L. LeGouet, J. L. Picque, F. Wuilleumier, J. M. Bizau, and P. Dhez. Mar 82, 6p
Grant NATO-1735
Sponsored in part by Centre National de la Recherche Scientifique, Orsay (France).
Pub. in Physical Review Letters 48, n9 p600-603, 1 Mar 82.

A sodium atomic beam with density 10 to the 13th power/cc was illuminated by cw dye laser radiation (a few watts per square centimeter) tuned to the D2 resonance line. In the energy spectrum of the emitted electrons, several lines were observed between 4 and 7 eV. Their positions and intensities indicate that seed electrons are produced either via associative ionization or via collisional ionization from excited states populated by energy-pooling collisions. These electrons are then heated through successive superelastic collisions with excited 3p atoms.

PB82-265653 Not available NTIS
National Bureau of Standards, Washington, DC.
Comparison of the NBS and Helsinki Temperature Scales and Its Effect on the Heat Capacity of Liquid (3)He Below 10 mK.
Final rept.,
E. Lhota, M. T. Manninen, J. P. Pekola, A. T. Soinne, and R. J. Soulen, Jr. Aug 81, 5p
Prepared in cooperation with Finnish Academy, Helsinki.
Pub. in Physical Review Letters 47, p590-592, 24 Aug 81.

The Helsinki temperature scale, used earlier in measurements of the heat capacity of liquid He3 between 1 and 10 mK, is compared with the NBS noise and NO temperature scale. The superfluid transition temperature of He3 at zero pressure and superconductive transition temperatures of tungsten and beryllium samples were used as fixed points. The value for T sub c on the extrapolated NBS scale was found to be 1.025 plus or minus 0.02 mK, in close agreement with the Helsinki value 1.04 mK. The results support the Helsinki data on the heat capacity of He3.

PB82-265679 Not available NTIS
National Bureau of Standards, Washington, DC.
Shift of doublet S (1/2) Hyperfine Splittings Due to Blackbody Radiation and its Influence on Frequency Standards.
Final rept.,
Wayne M. Itano, L. L. Lewis, and D. J. Wineland. Dec 81, 7p
Pub. in Jnl. Phys. Colloq. C8, 42n12 p283-287 Dec 81.

Frequency shifts of hyperfine splittings of doublet S (1/2) states due to the blackbody electric field are calculated. It is shown that they can be estimated from the dc hyperfine Stark shifts, which have previously been measured in the ground states of hydrogen and the alkali atoms. The shifts scale as T to the 4th power. The fractional shift for Cs at 300 K is -1.7 x 10 to the minus 10th power, which is large enough to be significant in primary frequency standards, and should be measurable. A simple method of calculating the hyperfine Stark shifts is described, which is based on the Bates-Damgaard method for determining radial matrix elements and the Fermi-Segre formula for determining the contact hyperfine matrix elements.

PB82-266420 PC **A02**/MF **A01**
National Inst. for Metallurgy, Randburg (South Africa).
A Process for the Recovery of Mixed Rare-Earth Oxides from Monazite,
W. A. M. Te Riele. 28 May 82, 18p NIM-2010D, ISBN-0-86999-580-4

A simple process has been demonstrated in the laboratory for the production of mixed rare-earth oxides from monazite concentrate. The product is substantially free from radioactive materials and has a purity of more than 98 per cent. The process involves leaching, filtration, ion exchange by use of a cation resin, precipitation, and calcination. The design, materials, consumption and cost of chemicals, and labor requirements are discussed, and a recommendation is made for pilot-plant tests.

PB82-875840 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Mossbauer Effect. November, 1973-September, 1982 (Citations from the NTIS Data Base).
Rept. for Nov 73-Sep 82.
Sep 82, 337p
Supersedes PB80-855935.

This bibliography contains citations concerning studies done on the Mossbauer effect in various materials. The use of the Mossbauer effect in instruments designed to analyze activation energies, surface stresses, and magnetic properties are also considered. (This updated bibliography contains 300 citations, 100 of which are new entries to the previous edition.)

PB82-875881 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Molecular Orbital Theory. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 167p

This bibliography contains citations concerning molecular orbital theory and calculations in molecular structure and spectra. Molecular energy levels, electronic states, rotational spectra, and ionization energies are discussed. Bonding characters and graph theory of molecular orbitals are included. Molecular orbital theories of chemical reactivity and crystal field interactions are considered. (Contains 135 citations fully indexed and including a title list.)

PB82-876384 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Performance Liquid Chromatography. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 253p
Supersedes PB82-855396.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliographycontains citations concerning high-performance (or high-pressure or high-speed) liquid chromatography techniques and applications. The characterization, analysis, detection, and separation of various substances (including organic compounds such as polycyclic aromatic compounds, water, pollutants, and wastes) are considered. (This updated bibliography contains 235 citations, 71 of which are new entries to the previous edition.)

7E. Radio and Radiation Chemistry

AD-A118 537/0 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.
Multiple Infrared Photon Dissociation and Kinetics of CF3O Radicals,
Fumin Zhang, J. S. Francisco, and J. I. Steinfeld. 10 Nov 81, 6p AFOSR-TR-82-0629
Grant AFOSR-78-3725
Pub. in Jnl. of Physical Chemistry, v86 n13 p2402-2406 1982.

No abstract available.

AD-A118 727/7 Not available NTIS
Wayne State Univ., Detroit, MI. Dept. of Chemistry.
Chemiluminescence from a Phenoxide-Substituted 1,2-Dioxetane: A Model for Firefly Bioluminescence,
A. Paul Schaap, and Steven D. Gagnon. 19 Feb 82, 5p ARO-18554.1-CH
Contract DAAG29-82-K-0008
Availability: Pub. in Jnl. of the American Chemical Society, v104 n12 p3504-3506 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

DE82903321 PC **A02**/MF **A01**
British Columbia Univ., Vancouver. Dept. of Physics.
Muonium in Al sub 2 O sub 3 Powder at Low Temperature.
R. F. Kiefl, J. B. Warren, C. J. Oram, J. H. Brewer, and D. R. Harshman. Apr 82, 3p TRI-PP-82-10, CONF-820434-1
International conference on positron annihilation, Arlington, TX, USA, 3 Apr 1982, Portions of document are illegible.
U.S. Sales Only.

Measurements of muonium (mu exp + e exp -) spin relaxation in a finely powdered sample of gamma -Al sub 2 O sub 3 in a He (or Ne) atmosphere indicate that the muonium atoms escape the powder grains with a high efficiency at low temperatures ($T < 30$ K). The muonium spin relaxation rate is proportional to the fraction of the powder surface area not covered by adsorbed He. (ERA citation 07:048340)

PB82-261546 Not available NTIS
National Bureau of Standards, Washington, DC.
The Photolysis and Radiolysis of Cyclopentane in the Liquid Phase.
Final rept.,
P. Ausloos, S. G. Lias, and R. E. Rebbert. Aug 81, 7p
Pub. in Jnl. Phys. Chem. 85, n16 p2322-2328, 6 Aug 81.

The liquid phase photolysis of cyclopentane has been investigated at energies below (7.6, 8.4 eV) and above (10.0, 11.6 eV) the ionization threshold (8.7 eV). The molecules excited by photon absorption and by charge recombination undergo four major dissociation processes. By comparing the relative abundances of these fragmentation channels with their quantum yields in the photolysis experiments at different energies, it is found that the average excitation energy of the cyclopentane molecules formed by charge recombination is in excess of 10 eV. Partial retention of the internal energy of the parent ions at the time of return of the geminate electron is suggested.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

PB82-261058 PC **A02**/MF **A01**
Nederlands Centrum voor Oceanografische Gegevens, De Bilt.
Sea-Going Measurement Programmes in the Netherlands: 1982 Planned.
Mar 82, 14p

This publication contains a systematic overview of planned sea-going measurement programs by Netherlands institutions and organizations for 1982. Some of the subject areas covered are meteorology, marine geophysics, physical oceanography, pollution and ocean dynamics.

PB82-262676 PC **A10**/MF **A01**
National Marine Fisheries Service, Seattle, WA.
Sharks of the Genus 'Carcharhinus'.
Technical rept.,
J. A. F. Garrick. May 82, 205p NOAA-TR-NMFS-CIRC-445, NOAA-82072906

The genus Carharhinus blainville contains 25 living species of whaler sharks, one of which (C. wheeleri) is described as new while the other 24 incorporate 95 identifiable nominal species which fall into the limits of the genus as here recognized. Features studied include morphometrics, external morphology, color, tooth numbers and shapes, vertebral numbers and other vertebral characteristics, and biological data.

PB82-263203 PC **A06**/MF **A01**
National Research Council, Washington, DC. Committee to Evaluate Antarctic Marine Ecosystem Research.
An Evaluation of Antarctic Marine Ecosystem Research,
1981, 118p
Contract MM1800913-2, Grant NSF-DPP79-27065
Sponsored in part by National Oceanic and Atmospheric Administration, Rockville, MD.

The National Research Council's Polar Research Board published An Evaluation of Antarctic Marine Ecosystem Research, the report of a committee it established jointly with the Ocean Sciences Board to consider research opportunities in the Southern Ocean, targets for U.S. contribution to the international 'Biological Investigations of Antarctic Marine Systems and Stocks' research effort, and management of the international research program. The report concludes that the United States should have a strong Antarctic marine program because of the great intrinsic interest of this region, as well as its renewable and nonrenewable resources and the issues raised by their exploration. The report recommends that the U.S. studies focus on krill patchiness and the special physical environment at the ice edge.

PB82-264995 PC **A22**/MF **A01**
National Museum of Natural History, Washington, DC.
Marine Birds of the Southeastern United States and Gulf of Mexico. Part II: Anseriformes,
Roger B. Clapp, Deborah Morgan-Jacobs, and Richard C. Banks. Jul 82, 508p FWS/OBS-82/20
Contract DI-14-16-0009-78-917
Library of Congress catalog card no. 82-600553.

This report describes the distribution, abundance, habitat, food habits and other aspects of the life history, and susceptibility to oil of 41 species of waterfowl of the order Anseriformes in the southeastern Atlantic and Gulf of Mexico. Winter distribution maps for the more common species are presented. An extensive, chronological bibliography accompanies each species account. The report is a planning tool for the Bureau of Land Management, other Federal and State agencies, and private companies dealing with oil impacts in coastal waters.

PB82-265489 PC **A04**/MF **A01**
Anne Arundel Community Coll., Arnold, MD. Environmental Center.
Sediment Suspension and Resuspension from Small-Craft Induced Turbulence,
Hermann Gucinski. Sep 82, 73p EPA-600/3-82-084, EPA/CBP-TR-006S
Contract EPA-78-D-X0426

The objective of this study was to determine if small vessels, operating in shallow waters, have any measurable effects in producing increased turbidities by the resuspension of fine sediments which may affect submerged aquatic vegetation (SAV). A two-phase approach was used, consisting of field tests in a suitable sub-estuary of the Chesapeake Bay, and laboratory measurements of propeller effects. During field trials, two different vessel types were used to make passes at set speeds over known water depths. Before and after measurements of light extinction, transmission, and gravimetric suspended sediment determinations were used to identify effects. Laboratory experiments were conducted to delineate propeller contribution to possible resuspension; this was done using laser-doppler anemometry to map the turbulence field produced by propeller action.

PB82-266156 PC **A09**/MF **A01**
Fish and Wildlife Service, Laurel, MD. Migratory Bird and Habitat Research Lab.
Distribution and Abundance of Waterfowl and Submerged Aquatic Vegetation in Chesapeake Bay.
Rept. for 1 Aug 78-31 Dec 80,
Robert E. Munro, and Matthew C. Perry. Sep 82, 193p EPA-600/3-82-082, EPA/CBP-TR-001S

Waterfowl species populations in Maryland and Virginia portions of Chesapeake Bay were examined during long-term and current (1972-1980) periods to identify trends in distribution and abundance. Comparisons were also made between State and Atlantic Flyway populations and waterfowl species distributions among survey areas. Distribution and abundance of submerged aquatic vegetation among waterfowl survey areas in Md. were summarized for 7 plant species during 9 years (1971-1979). These data (SAV species combined) were used to test the hypothesis that annual variation in area populations of waterfowl was related to variation in the abundance of SAV, following an adjustment for annual variation in the general abundance of waterfowl. There were few statistically significant relationships between distribution and abundance of waterfowl and SAV.

8B. Cartography

AD-A118 455/5 PC **A02**/MF **A01**
Defense Mapping Agency Aerospace Center, St. Louis AFS, MO.
Charting Utilization Requirements for a Digital Cartographic Data Base,
Dennis P. Franklin. 1982, 14p

The application of computers and computer processes to support chart production at the Defense Mapping Agency Aerospace Center (DMAAC) is discussed. The chart production process is continually being analyzed for application to automation. Source assessment and inventory, control, data collection, chart compilation and revision, color separation and printing can be enhanced or accomplished by automated processes.

AD-A118 465/4 PC **A02**/MF **A01**
Defense Mapping Agency Hydrographic/Topographic Center, Washington, DC.
Software for Three Dimensional Topographic Scenes,
Joseph H. Honablew, Joseph J. Schlueter, and Arthur A. Noma. Aug 82, 25p Rept no. AUTO-CARTO-5/ISPRSIV

The paper discusses the current capability for portraying three dimensional topographic scenes at the Defense Mapping Agency, Hydrographic/Topographic Center and a background of its current usage and potential applications. A number of illustrations of scenes produced using Digital Terrain Elevation Data (DTED) and overlayed Digital Feature Analysis Data (DFAD) will be presented. Planned enhancements will be discussed with illustrations of type of results to be produced. (Author)

AD-A118 480/3 MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Beach Profile Analysis System (BPAS). Volume VIII. Supporting Appendixes for BPAS User's Guides.
Technical rept.,
Marilyn V. Fleming, and Allan E. DeWall. Jun 82, 84p
Rept no. CERC-TR-82-1-VOL-8
Availability: Microfiche copies only.

A package of computer programs for editing, analyzing, and displaying beach profile survey data has been developed. The eight-volume package, named the Beach Profile Analysis System (BPAS), consists of an overview of the BPAS program, two editing programs, five analysis programs, and supporting appendixes. (Author)

AD-A118 738/4 PC **A05**/MF **A01**
University of Southern California, Los Angeles.
Image Understanding Research.
Final technical rept. 1 Oct 81-28 Feb 82,
Ramakant Nevatia. Mar 82, 82p AFWAL-TR-82-1111
Contract F33615-80-C-1080, DARPA Order-3119

This report describes techniques for symbolic matching of aerial images with other images or maps. Aerial images contain natural features and also man-made 3-D structures. Techniques for scene segmentation and description for these matching tasks are presented. (Author)

N82-29635/1 PC **A05**/MF **A01**
Institut fuer Angewandte Geodaesie, Frankfurt am Main (Germany, F.R.).

Reports on Cartography and Geodesy. Series 1: Original Reports, Number 83 Nachrichten Aus Dem Karten- und Vermessungswesen. Reihe 1: Originalbeitraege, Heft Nr. 83.
1981, 80p ISSN-0469-4236
In German; English Summary.

No abstract available.

N82-29643/5 PC **A04**/MF **A01**
Institut fuer Angewandte Geodaesie, Frankfurt am Main (Germany, F.R.).
Reports on Cartography and Geodesy. Series 1: Original Reports, Number 84 Nachrichten Aus Dem Karten- und Vermessungswesen. Reihe 1: Originalbeitraege, Heft Nr. 84.
1981, 63p ISSN-0469-4236
In German; English Summary. MAP Supplement Included. Original Contains Color Illustrations.

No abstract available.

N82-29649/2 PC **A08**/MF **A01**
Institut fuer Angewandte Geodaesie, Frankfurt am Main (Germany, F.R.).
Reports on Cartography and Geodesy. Series 1: Original Reports, Number 85 Nachrichten Aus Dem Karten- und Vermessungswesen. Reihe 1: Originalbeitraege, Neft Nr. 85.
1981, 175p ISSN-0469-4236
In German; English Summary. Original Contains Color Illustrations.

No abstract available.

N82-29664/1 PC **A06**/MF **A01**
Institut fuer Angewandte Geodaesie, Frankfurt am Main (Germany, F.R.).
Reports on Cartography and Geodesy. Series 1: Original Reports, Number 86 Nachrichten Aus Dem Karten- und Vermessungswesen. Reihe 1: Originalbeitraege, Heft Nr. 86.
1981, 102p ISSN-0469-4236
In German; English Summary. Original Contains Color Illustrations.

No abstract available.

N82-29675/7 PC **A10**/MF **A01**
Kent State Univ., OH. Dept. of Geology.
Evaluation of Terrain Complexity by Autocorrelation.
Final Report.
R. G. Craig. 1982, 215p NASA-CR-169140, NAS 1.26:169140
Contract NAG5-165

The topographic complexity of various sections of the Ozark, Appalachian, and Interior Low Plateaus, as well as of the New England, Piedmont, Blue Ridge, Ouachita, and Valley and Ridge Provinces of the Eastern United States were characterized. The variability of autocorrelation within a small area (7 1/2-ft quadrangle) to the variability at widely separated and diverse areas within the same physiographic region was compared to measure the degree of uniformity of the processes which can be expected to be encountered within a given physiographic province. The variability of autocorrelation across the eight geomorphic regions was compared and contrasted. The total study area was partitioned into subareas homogeneous in terrain complexity. The relation between the complexity measured, the geomorphic process mix implied, and the way in which geobotanical information is modified into a more or less recognizable entity is demonstrated. Sampling strategy is described.

PB82-927916 PC **E02**
Central Intelligence Agency, Washington, DC.
Mainland Southeast Asia (Map No. 505300).
Aug 82, 17p
Color illustrations reproduced in black and white.
Paper copy also available on Standing Order, Deposit Account required. North American Continent price based on page count of individual documents; all others write for quote. This series offers a reduction in price as a Standing Order, PB82-927900.

The report is a political wall map of Mainland Southeast Asia with selected cities and differentiated color tones for countries. Map scale 1:3,000,000.

8C. Dynamic Oceanography

AD-A118 496/9 PC **A08**/MF **A01**
Delaware Univ., Newark. Dept. of Civil Engineering.
Wave Spectral Transformation in Shallow Water.
Technical rept.,
Yun-Hai Chen, and Hsiang Wang. Jun 82, 163p Rept nos. CE-82-23, TR-10
Contract N00014-81-K-0297

The purpose of this study is to develop a numerical method to compute shallow water wave spectral transformation both for stationary and non-stationary cases. A numerical model for stationary wave spectral transformation has been developed by Shiau and Wang (1977) and further amplified by Wang and Yang (1981). The present work extends the model to add bottom friction and local wind generation. This model is applicable to wave spectral transformation under stationary meteorological conditions. If the meteorological condition is non-stationary in the generating area or the local wind effect in the domain of consideration can no longer be neglected, such as when a hurricane or storm sweeps through offshore of a coastal region, the wave spectral transformation in shallow water should also be treated as non-stationary. A non-stationary wave spectral transformation model is thus developed to handle these cases. (Author)

AD-A118 518/0 PC **A08**/MF **A01**
Delaware Univ., Newark. Dept. of Civil Engineering.
Numerical Modeling of the Nearshore Region.
Technical rept.,
James T. Kirby, Jr., and Robert A. Dalrymple. Jun 82, 171p Rept nos. CE-82-24, TR-11
Contract N00014-81-K-0297

In this chapter the theoretical framework for the development of time averaged governing equations for the problem of waves and currents in the nearshore zone is outlined. The development of the numerical circulation models in either the 'linear' or 'nonlinear' form is then described in Chapter III based on the theoretical framework. In general, the development of each model has been described in previous technical reports; the linear model in Birkemeier and Dalrymple (1976), and the nonlinear model in Ebersole and Dalrymple (1979). For this reason, some of the derivations and intermediate steps needed to develop the governing equations are not described in detail in the present report. The reader can refer to the previous work for missing details. However, both models now include the option of calculating wave energy decay due to interaction with the bottom, which has not been included in previous reports. The theory and implementation of this option is described in detail. (Author)

AD-A118 688/1 PC **A10**/MF **A01**
City Univ. of New York. Inst. of Marine and Atmospheric Sciences.
The Spectral Ocean Wave Model (SOWM), a Northern Hemisphere Computer Model for Specifying and Forecasting Ocean Wave Spectra.
Final rept.,
Willard J. Pierson. Jul 82, 203p DTNSRDC-82/011
Contract N00167-80-M-4781

The Spectral Ocean Wave Model (SOWM) in use at the Fleet Numerical Oceanography Center since 1974 has been used to produce spectra for a 20-year ocean wave climatology for the Northern Hemisphere oceans. The data sources and concepts used to develop the computer model are described; and the equations and computer program structure for the model are given in this report. The accuracy of the model is evaluated by analysis of studies that used spacecraft radar altimeter measurements of significant wave height and by comparison of predicted and estimated frequency spectra and significant wave heights. This report also describes sampling variability effects and incorporates them into the interpretation of the accuracy of the model specifications. In addition, rapid spatial and temporal variations of actual waves that are not reproduced by the model are documented; and possible errors in the specification of swell are suggested. With care in interpretation, a SOWM wave climatology, which is in preparation, should prove to be more accurate than those based on conventional ship reports. (Author)

AD-A118 729/3 PC **A02**/MF **A01**
Coastal Engineering Research Center, Fort Belvoir, VA.
Wave Measurements in ARSLOE,
C. L. Vincent, and D. E. Lichy. 1981, 18p Rept no. CERC-REPRINT-82-4
Pub. in Proceedings of the Conference on Directional Wave Spectra Applications, ASCE, Berkeley, CA., p71-86 14-16 Sep 81.

No abstract available.

PB82-261033 PC **A03**/MF **A01**
Nederlands Centrum voor Oceanografische Gegevens, De Bilt.
Sea-Going Measurement Programmes in the Netherlands: 1980 Completed.
Jul 81, 39p

In this report, a survey is presented of the sea-going research projects as completed by Netherlands institutes and organizations in 1980. The survey is visualized in two ways: by a computer listing, and by a series of maps. Bathymetric surveys, ocean temperature and salinity and water quality with navigation charts are included in the report.

PB82-261249 PC **A03**/MF **A01**
Sentralinstitutt for Industriell Forskning, Oslo (Norway).
Measurement of Wave Power Available for Focusing: Discussion and Recommendations.
Technical rept.,
Hans M. Pedersen. 17 Dec 80, 43p 78-04-10-4, ISBN-82-7267-277-4
Portions of this document are not fully legible.

The ocean wave energy project at the Central Institute for Industrial Research (CIIR) involves concentration of the wave energy, by means of focusing, prior to the energy conversion. In order to evaluate the usefulness of this concept, the authors needed information about the amount of wave energy that can be collected by means of wave focusing. For that purpose, the authors need data on the directional and frequency distribution of the wave energy. The report considers this problem in some detail. A brief review is given of energy flux concentration by means of focusing and its dependence on wave statistics. The authors then consider the general problem of relating the appropriate wave characteristics to measureable quantities. The rest of the report is devoted to a review of possible measurement methods.

8D. Geochemistry

DE82903560 MF **A01**
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
Extraction of Thorium and Uranium from Swiss Granites.
C. Bajo. Dec 80, 168p EIR-418
In French.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The Mittagfluh, Bergell and Rotondo granites and the Giuv syenite offered a wide range of U and Th concentrations; 7.7 to 20.0 ppM U and 25.5 to 67.0 ppM Th. U and Th were determined in the leach solutions by the fission track method and by spectrophotometry, respectively. Samples, containing less than 0.3 mu g U and 4 mu g Th, could be measured with an accuracy of 10% for U and 5% for Th. Leach tests were performed during which the following parameters were varied: granite-type, grain size, acid-type, acid concentration, temperature and time. There were very great leaching differences between the granites studied. Grain size caused no great variation, the extracted percentages of U and Th were practically the same for any particular rock with either 12% or 71% of the grain size finer than 0.125 mm. The leached fraction with H sub 2 SO sub 4 was somewhat smaller than with HCl or HNO sub 3 . The difference in leaching with HCl 2M, 5M and 10M was negligible. Temperature was the most important parameter. Sharp differences in extraction occurred between 20 exp 0 C, 50 exp 0 C and 80 exp 0 C.

At 80 exp 0 C, more than 85% U and Th were extracted. As a general rule, Th extraction was better than U. The granites were mineralogically analyzed. The U distribution in the granites was studied both with the fission track method and with the electron microprobe analysis. The distribution of U in the rock structure and in the rock minerals varied greatly between any two granites. A mineralogical separation allowed the Th and U to be determined in zircon, epidote and allanite of the Mittagfluh, and enabled them to be leached under the same conditions as the unseparated rock. The results of these mineralogical analyses provide some support for the measured rock leaching differences. The increasing difficulties in the U availability and the relatively easy leaching of U and Th make granite an interesting long-range resource material. (ERA citation 07:044248)

PB82-253386 CP **T02**
Geological Survey, Denver, CO.
Geochemistry of Stream Sediment Samples and Rock Samples from the Selway-Bitterroot Wilderness, Montana and Idaho.
Data file,
Bert Coxe, Elwin Mosier, and Christine McDougal. Mar 82, mag tape DOI/DF-82/005
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

The tape holds nine separate data sets, each containing data from different sampled media. The first data set contains rock analyses, and the other eight contain analyses of various fractions of stream sediment and stream sediment concentrate, divided according to size, density and magnetic properties. The first 200 records contain text describing the various data sets including information on sampling, sample preparation, and analytical procedures. The 9 data sets follow. The first five records of each data set give the data set name, number of variables, and all variable identifiers; eg. an identifier of sfe% indicates a spectrographic analysis of iron listed in units of percent. The only analyses listed here other than spectrographic analyses are 196 delayed neutron activation analyses of less than 170 mesh stream sediments for uranium and thorium (data set 3). The variable identifiers for these analyses are acu and acth respectively.

8E. Geodesy

AD-A118 854/9 PC **A06**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
A Data Reduction Package for US Army Topographic Computers: Hand-Held Programmable Calculators.
Study project,
Walter Blackmer. 14 May 82, 103p

This study was done to provide the US Army with the basis for a standardized program package for use with hand-held, programmable calculators. The programs are written and published in a format which is immediately useable with the Texas Instruments Programmable 59 Calculator, but which can easily be adapted for use with other programmable calculators. Other Department of Defense agencies may also find them valuable in training and operational efforts. The study includes a general overview of the history of the Topographical Engineers. (Author)

PB82-253378 CP **T02**
Geological Survey, Denver, CO.
Conterminous U.S. Free-Air Gravity Anomaly Data in a Gridded Format.
Data file,
Richard H. Godson. May 82, mag tape DOI/DF-82/006
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Conterminous U.S. gravity anomaly data in a gridded format are contained on a 9-track magnetic tape described in this report. The tape was written at a density of 800 BPI and contains one file of 773 records of 5200 EBCDIC characters each. The data consist of free-air gravity anomaly values. Although the data have been extensively edited, a few erroneous values may remain.

PB82-254798 CP **T02**
Geological Survey, Denver, CO.
Conterminous U.S. Gravity Anomaly Data in a Gridded Format.
Data file,
Richard H. Godson. May 82, mag tape DOI/DF-82/004
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Conterminous U.S. gravity data in a gridded format are contained on a magnetic tape described in this report. The tape contains 773 records of 5200 EBCDIC characters each in one file. The data consist of Bouguer gravity anomaly values calculated using a density of 2.67 g/cu.cm. on land and free-air gravity anomaly values offshore. Terrain corrections were computed for those stations in areas of substantial relief. The data have been extensively edited but may still contain a few erroneous values unknown to the authors.

8F. Geography

N82-29674/0 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Science Requirements for Free-Flying Imaging Radar (FIREX) Experiment for Sea Ice, Renewable Resources, Nonrenewable Resources and Oceanography.
F. Carsey. 1 Jun 82, 54p NASA-CR-169153, JPL-PUBL-82-32
Contract NAS7-100

A future bilateral SAR program was studied. The requirements supporting a SAR mission posed by science and operations in sea-ice-covered waters, oceanography, renewable resources, and nonrenewable resources are addressed. The instrument, mission, and program parameters were discussed. Research investigations supporting a SAR flight and the subsequent overall mission requirements and tradeoffs are summarized.

8G. Geology and Mineralogy

AD-A118 463/9 PC **A04**/MF **A01**
Association Scientifique Culturelle et Educative de Bonas, Chateau de Bonas (France).
Abstracts of the Thirteenth International Conference on Mathematical Geophysics.
26 Jun 82, 69p
Grant N00014-82-G-0071

No abstract available.

AD-A118 686/5 PC **A06**/MF **A01**
Naval Weapons Center, China Lake, CA.
Evaluation of Geothermal Potential of the Naval Air Weapons Training Complex, Fallon, Nevada.
Interim rept. FY 81,
Allan M. Katzenstein, and Kathy J. Danti. Apr 82, 112p Rept no. NWC-TP-6359

The Geothermal Utilization Division of the Naval Weapons Center has been exploring geothermal potentials at various sites of the Naval Weapons Complex, Fallon, Nev. The purpose of the exploration program is to determine adequacy of geothermal resources for energy self-sufficiency of the Naval Air Station Fallon. The present report presents the results of studies at NAS Fallon and Ranges Bravo 16 and 19 that included thermal gradient drilling: aeromagnetics, gravity, and land magnetics studies; and the drilling of one 2,000-foot observation hole. The results indicated a high geothermal potential at NAS Fallon and better than average potentials for Ranges Bravo 16 and 19. (Author)

AD-A118 743/4 PC **A03**/MF **A01**
Naval Weapons Center, China Lake, CA.
Reconnaissance Geology and Structure of the Coso Range, California.
Final rept. 1975-1981,
Glenn R. Roquemore. May 82, 48p Rept no. NWC-TP-6036
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

The Coso Range was mapped at a scale of 1:62,500 in order to collect basic petrographic, petrologic, and chemical data. Special attention was given to individual fault zones and regional fault patterns. The basement in the Coso Range consists of Mesozoic age granitic rock and metamorphic inclusions. Tertiary aged dacite tephra and flows cover the northern and western parts of the Range. Quaternary basalts, andesites, and rhyolites cover the central and eastern parts of the Range. The Coso Range has been broken by Basin and Range extensional faulting, as seen in extensive horst and graben development and right-slip displacement evidenced by ramping, oblique-slip striations, and lateral-slip fault morphology. (Author)

AD-A118 824/2 PC **A02**/MF **A01**
Lamont-Doherty Geological Observatory, Palisades, NY.
Structure of the New Hebrides Arc-Trench System,
A. K. Ibrahim, B. Pontoise, G. Latham, M. Larue, and T. Chen. 24 May 79, 20p Rept no. LDGO-2922
Contract N00014-75-C-0210, Grant NSF-OCE76-10881
Pub. in Jnl. of Geophysical Research, v85 nB1 p253-274, 10 Jan 80.

No abstract available.

DE82013263 MF **A01**
Bendix Field Engineering Corp., Grand Junction, CO.
Calderas and Mineralization: Volcanic Geology and Mineralization in the Chianti Caldera Complex, Trans-Pecos Texas.
T. W. Duex, and C. D. Henry. 1981, 16p DOE/GJ/01664-T3
Contract AC13-76GJ01664
Available in microfiche only.

This report describes preliminary results of an ongoing study of the volcanic stratigraphy, caldera activity, and known and potential mineralization of the Chinati Mountains area of Trans-Pecos Texas. Many ore deposits are spatially associated with calderas and other volcanic centers. A genetic relationship between calderas and base and precious metal mineralization has been proposed by some and denied by others. Steven and others have demonstrated that calderas provide an important setting for mineralization in the San Juan volcanic field of Colorado. Mineralization is not found in all calderas but is apparently restricted to calderas that had complex, postsubsidence igneous activity. A comparison of volcanic setting, volcanic history, caldera evolution, and evidence of mineralization in Trans-Pecos to those of the San Juan volcanic field, a major mineral producer, indicates that Trans-Pecos Texas also could be an important mineralized region. The Chianti caldera complex in Trans-Pecos Texas contains at least two calderas that have had considerable postsubsidence activity and that display large areas of hydrothermal alteration and mineralization. Abundant prospects in Trans-Pecos and numerous producing mines immediately south of the Trans-Pecos volcanic field in Mexico are additional evidence that ore-grade deposits could occur in Texas. (ERA citation 07:044861)

DE82013768 MF **A01**
Texas Univ. at Austin. Bureau of Economic Geology.
Geology and Geohydrology of the Palo Duro Basin, Texas Panhandle. A Report on the Progress of Nuclear Isolation Feasibility Studies, 1980. Annual Report, October 1, 1979-September 30, 1980.
T. C. Gustavson, R. L. Bassett, and R. J. Finley. 1981, 181p DOE/ET/46615-T2
Contract AC97-80ET46615
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Since early 1977, the Bureau of Economic Geology has been evaluating several salt-bearing basins within the State of Texas as part of the national nuclear repository program. The Bureau, a research unit of the University of Texas and the State of Texas, is conducting a long-term program to gather and interpret all geologic and hydrologic information necessary for description, delineation, and evaluation of salt-bearing and related strata in the Palo Duro and Dalhart Basins of the Texas Panhandle. The program in FY 1980 was divided into five broad research tasks, which were addressed by a surficial analysis and shallow stratigraphy group, a hydrology and geochemistry group, a basin analysis group, a host-rock analysis group, and a seismicity and tectonic environment group. The surficial analysis and shallow stratigraphy group has collected remotely sensed, surface and subsurface data to describe land resources, surface processes, and rates and styles of geomorphic development. The hydrology and geochemistry group has continued analysis of shallow and deep fluid circulation within the basins and has initiated studies of rock and fluid geochemistry within the salt-bearing units. The basin analysis group has characterized the major salt-bearing stratigraphic units within the basins and has assessed the potential for generating and trapping hydrocarbons within the basins. Concurrently, the host-rock analysis group has continued a study of cores from two drilling sites for analysis of salt and other lithologic units within the cores. The newly formed seismicity and tectonic environment group has initiated studies of deep-basement structure and tetonic development of the basin and has made an analysis of surface fracture systems. This paper, a summary of progress during FY 1980, presents principal conclusions and reviews methods used and types of data and maps generated. (ERA citation 07:042488)

DE82015890 MF **A01**
Los Alamos National Lab., NM.
Orientation of Least-Principal Horizontal Stress: Arizona, New Mexico, and the Trans-Pecos Area of West Texas: Stress Data and References.
M. J. Aldrich, Jr., and A. W. Laughlin. Feb 82, 43p
LA-9158-MAP
Contract W-7405-ENG-36
Best available copy from document source. Available in microfiche only.

This map is one of a series designed for hot dry rock geothermal assessment in Arizona, New Mexico, and the Trans-Pecos area of west Texas. It is intended to be used for predicting the orientations of hydrofractures that might form during future HDR energy operations. Indicators of principal stress orientation include alignments of young volcanic vents, trends of young dikes, slickensides on oblique-slip normal faults, earthquake focal mechanism solutions, hydrofracture orientations, and strain relief determinations. Stress provinces were delineated using the stress data in conjunction with geologic maps of the region. The Basin and Range stress province is characterized by least-principal horizontal stresses that are generally oriented west to west-northwest approximately perpendicular to the north-trending ranges. In southwestern Arizona, where the ranges and basins trend northwest, the least-principal horizontal stress directions are mostly oriented east-northeast. This segment of the Basin and Range Province is therefore shown as a subprovince (Sonoran). The Transitional Province, which wraps around the south edge of the Colorado Plateau, has stress orientations characteristic of both the Colorado Plateau and Basin and Range stress provinces. (ERA citation 07:048266)

DE82780495 MF **A01**
Gesellschaft fuer Strahlen- und Umweltforschung m.b.H., Neuherberg bei Munich (Germany, F.R.). Inst. fuer Radiohydrometrie.
Tracer Investigations in Hydrogeology and Hydrology.
Dec 80, 149p GSF-R-250
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Selected papers are indexed separately. (ERA citation 07:048264)

DE82903027 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Radiazioni e Ricerche di Sicurezza e Protezione.
Geologic Criteria for the Identification Clay Basins Favorable for the Disposal of Radioactive Wastes. Study of the Italian Pliocene Formation.
B. Anselmi, A. Brondi, O. Ferretti, and W. Gerini. May 81, 66p CNEN-RT/PROT-(81)16
In Italian.Portions of document are illegible.
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The deeply buried clay deposits represent an area of study of great interest. The mineralogy, the homogeneity degree, the mutual relationships with perturbing formations, such as arenaceous bed, and other structural characters of the above mentioned deposits are generally very poorly known. Direct information may be however obtained by means of the poorly known. Direct information may be however obtained by means of the examination of the often outcropping marginal parts of the deep clay deposits. These informations may be expected at same degree extendible to the corresponding buried deposits. More uncertain and only predictive, though useful, information may be got by means of the recognition of the relationships, if existing, between the lithological nature of ancient feeder basins and mineralogic composition of ancient sedimentary basins. If the other conditions are equivalent the above mentioned knowledges may both help in orientating choice to more suitable situations if this is needed. In order to answer these problems, low density systematic research has been carried on pliocenic clays occurring in the Italian territory. These are the main results obtained: 1) Pliocenic clays are geographycally divided in many mineralogic provinces corresponding to two more comprehensive ones, that is a kaolinic-illitic one and a fundamentally smectitic one; 2) coarse relationships exist between lithological feature of the ancient feeder basins and mineralogical nature and setting of the derived sedimentary formations. (ERA citation 07:044872)

DE82903485 MF **A01**
Bundesanstalt fuer Geowissenschaften und Rohstoffe, Hanover (Germany, F.R.).
Genesis of the Methane in Lake Kivu (Central Africa).
K. Tietze, M. Geyh, H. Mueller, L. Schroeder, and W. Stahl. 1980, 23p NP-2903485
In German.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Large amounts of methane and carbon dioxide, among other gases, are dissolved in the deep water of Lake Kivu. There is no dispute about the primarily magmatic origin of the carbon dioxide, but models of the genesis of the methane have been contradictory up to now. They have been based on too few and partly too inaccurate data. On the basis of new measurements obtained from gas and sediment samples, some of the old concepts have been further developed to a new model. According to this model, the methane is generated mainly by bacteria from the organic carbon of the sediment. It probably also contains minor amounts of the thermocatalytic methane. About 70 of the organic carbon of the upper sediment is derived from mainly magmatic carbon dioxide (old carbon), which enters the biozone of the Lake from the deep water by eddy diffusion and is assimilated there. The remaining 30 comes from atmospheric carbon dioxide (young carbon) assimilated in the biozone. But because methane also migrates into the lake from deeper sediment, the exp 14 C-content in the methane dissolved in the lake water is not 30 modern but only ca. 10 modern. More isotropic measurements on plankton, methane, carbon dioxide and sediment samples are necessary to support this model. (ERA citation 07:042328)

DE82903710 PC **A09**/MF **A01**
Geological Survey, Tulsa, OK.
Combined Bibliographies of Oklahoma Geology. Volume 1. 1955-1970. Special Publication 81-5.
E. A. Ham, and C. Gay. 1981, 188p NP-2903710

This annotated bibliography contains references to Oklahoma geology. Included are journal items, theses, abstracts, books, maps, open-file reports, and symposium articles. (ERA citation 07:048270)

DE82904066 PC **A10**/MF **A01**
Geological Survey, Tulsa, OK.
Combined Bibliographies of Oklahoma Geology. Volume 2. 1971-1979. Special Publication 81-5.
E. A. Ham, and C. Gay. 1981, 206p NP-2904066
Portions of document are illegible.

This annotated bibliography contains references to Oklahoma geology. Included are journal articles, theses, abstracts, books, maps, open-file reports, and symposium articles. (ERA citation 07:048271)

N82-29677/3 PC **A03**/MF **A01**
Washington Univ., St. Louis, MO. Center for the Space Sciences.
Pattern, Age, and Origin of Structural Features within the Ozark Plateau and the Relationship to Ore Deposits.
Final Report, 1 Jan. 1981 - 31 Dec. 1981.
R. E. Arvidson. 31 Dec 81, 48p NASA-CR-169202, JPL-9950-708
Contracts NAS7-100, JPL-955959
Prepared for JPL.

Topography and gravity anomaly images for the continental United States were constructed. Evidence was found based on gravity, remote sensing data, the presence, trend, and character of fractures, and on rock type data, for a Precambrian rift through Missouri. The feature is probably the failed arm of a triple junction that existed prior to formation of the granite-rhyolite terrain of southern Missouri.

N82-29678/1 PC **A04**/MF **A01**
Henry Krumb School of Mines, New York. Aldridge Lab. of Applied Geophysics.
Infrared Airborne Spectroradiometer Survey Results in the Western Nevada Area.
Final Report.
W. Collins, S. H. Chang, and J. T. Kuo. May 82, 64p NASA-CR-169207, NAS 1.26:169207
Contracts NAS7-100, JPL-955832

The Mark II airborne spectroradiometer system was flown over several geologic test sites in western Nevada. The infrared mineral absorption bands were observed and recorded for the first time using an airborne system with high spectral resolution in the 2.0 to 2.5 micron region. The data show that the hydrothermal alteration zone minerals, carbonates, and other minerals are clearly visible in the airborne survey mode. The finer spectral features that distinguish the various minerals with infrared bands are also clearly visible in the airborne survey data. Using specialized computer pattern recognition methods, it is possible to identify mineralogy and map alteration zones and lithologies by airborne spectroradiometer survey techniques.

N82-29795/3 PC **A03**/MF **A01**
Office de la Recherche Scientifique et Technique Outre-Mer, Bondy (France).
Seismological Investigation of the Bangui Anomaly and Its Relation to the Margin of the Congo Craton.
Progress Report.
R. Godivier, C. Borbath, L. Borbath, and R. Gaulon. 20 Jul 82, 40p M-45

The inversion of teleseismic arrival times of P waves recorded by a temporary linear array of seismological stations in Central African Republic shows that structural variations persist down to a depth of 160 km at least. Crustal thickness is about 40 km. Lateral inhomogeneities may be related to the northern margin of the Congo craton where up to 4% higher velocities are observed. Similar patterns of the Bangui magnetic anomaly, one of the largest features occurring over a stable continent, and of the seismic velocity distribution indicate a close relation. The abnormal magnetic field would be due to deep structure with higher susceptibility.

PB82-262767 PC **A03**/MF **A01**
Bureau of Mines, Avondale, MD. Avondale Research Center.
Size and Shape Characterization of Fibrous Zeolites by Electron Microscopy.
Rept. of investigations/1982,
Kim B. Shedd, Robert L. Virta, and Ann G. Wylie. Jul 82, 27p BUMINES-RI-8674

The U.S. Bureau of Mines Particulate Mineralogy Unit examined the habits of six zeolite minerals commonly occurring in domestic zeolite deposits. A scanning electron microscopic study revealed that, of these six minerals, only mordenite and erionite crystallized in acicular to fibrous habits. The fibrous varieties of these two minerals were characterized by size and shape on the transmission electron microscope, and their dimensions were compared with those of asbestos and

amphibole cleavage fragments. When comminuted, these two minerals possess 'fibrosity indices' similar to those of amphibole cleavage fragments. One sample, a rare woolly erionite, has uniform widths, large aspect ratios, and a 'fibrosity index' similar to those of asbestos.

PB82-875774 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Montmorillonite. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 181p
Supersedes PB81-853780.

This bibliography contains citations concerning the origin, occurence, composition, chemical and physical properties, and uses of montmorillonite. The behavior of montmorillonite in association with various natural and man-made liquids and its effects on foundation structures, soils, petroleum reservoirs, and various chemical compounds and solutions are also considered. (This updated bibliography contains 130 citations, 45 of which are new entries to the previous edition.)

8H. Hydrology and Limnology

AD-A118 483/7 PC **A06**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Aquatic Biota of Bank Stabilization Structures on the Missouri River, North Dakota.
Final rept.,
Ralph M. Burress, Douglas A. Krieger, and C. H. Pennington. May 82, 107p Rept no. WES/TR/E-82-6
Report on Environmental and Water Quality Operational Studies.

Biological and physical data were collected from nine habitats on the Missouri River near Washburn, North Dakota. Sampling was conducted from mid-July to mid-October 1979 to compare the relative values of the habitats for fish and macroinvertebrates. Benthic samples included 11 families, among which oligochaetes (63 percent) and dipterans (34 percent) were numerically dominant. About half of the 166 samples taken at both structured and natural locations contained organisms, but 55 samples taken from mud or mud-fine sand substrates yielded 93 percent of the organisms collected. Although the numbers of taxa per station were not significantly different, there were significant differences in the mean numbers of organisms per station. Densities were greatest at two locations that included extensive areas of backwater (L-head dikes at Location DFH and wing dikes at Location DFW), and least at a revetted location (RVD) where the substrate was largely fine sand.

AD-A118 647/7 Not available NTIS
Hawaii Inst. of Geophysics, Honolulu.
Hawaiian Alpine Lake Level, Rainfall Trends, and Spring Flow,
Alfred H. Woodcock. 30 Aug 79, 15p Rept no. HIG-CONTRIB-1088
Availability: Pub. in Pacific Science, v34 n2 p195-209 1980 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 687/3 PC **A07**/MF **A01**
Bristol Univ. (England).
The Role of Hillslope Hollows in Generating River Discharge.
Final technical rept. Oct 78-May 82,
Malcolm G. Anderson. Apr 82, 141p
Grant DA-ERO-78-G-104

This investigation sought to undertake an analysis of soil water movement on shallow, undulating topography with the specific aim of isolating the spatial and temporal nature of hillslope zones contributing preferentially to streamflow in such topography. With the combined used of data on soil water potentials from the study site and a simulation program designed to replicate soil water movement processes on hillslopes, it was shown that only in relatively restrictive cases of topography/soil/stream gradient configurations, does soil water convergence always take place into hillslope hollows. The implications of this finding in the context of static indices, hitherto used to identify those hillslope zones that saturate preferentially, is discussed. It is further shown that relatively minor variations within the shallow topography area studied are capable of enducing significant differences in the hillslope outflow hydrographs.

AD-A118 694/9 PC **A05**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS. Environmental Lab.
Radiotelemetry Tracking at Lake Conway, Florida.
Final rept.,
Malcolm P. Keown, and Robert M. Russell, Jr. Aug 82, 78p Rept no. WES/TR/A-82-4

A Large-Scale Operations Management Test was initiated in 1976 at Lake Conway, Florida, to evaluate the use of the white amur fish as an operational method for the control of excessive aquatic plant growth. Since the stocking of Lake Conway with white amur in September 1977, sampling operations have indicated a definite reduction of aquatic plant populations due to the fish's presence. What could be determined from these observations was a correlation between fish movement within the lake system and the decline of the plants as a function of time. The examination of this problem indicated that radiotracking fish movements at comparible time intervals to the other data-collection efforts would provide the needed information.

AD-A118 700/4 PC **A04**/MF **A01**
Florida Univ., Gainesville. Dept. of Environmental Engineering Sciences.
Large-Scale Operations Management Test of Use of the White Amur for Control of Problem Aquatic Plants. Report 2. First Year Poststocking Results. Volume IV. Nitrogen and Phosphorus Dynamics of the Lake Conway Ecosystem: Loading Budgets and a Dynamic Hydrologic Phosphorus Model.
Technical rept.,
Eldon C. Blancher, and Charles R. Fellows. Aug 82, 64p WES-TR-A-78-2-2-VOL-4
Contract DACW39-76-C-0076
See also AD-A113 854.

An integrated nutrient budget for Lake Conway, Florida, was developed that integrated physical, chemical, and biological relationships. A hydrologic budget was constructed from measurements of stormwater runoff, subsurface seepage flows, and existing precipitation and evaporation data. It was determined that major sources of external nitrogen and phosphorus loadings were from atmospheric loadings, urban runoff, and subsurface seepage. Based upon a simulation model of the phosphorus dynamics of Lake Conway, it was concluded that sedimentation of phosphorus was occurring at higher than predicted rates, nutrient release by submerged macrophytes was salient to phosphorus dynamics, and release of phosphorus by sediments was not a significant internal source of this nutrient. (Author)

DE82002368 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Development of a Procedure to Estimate Runoff and Sediment Transport in Ephemeral Streams.
L. J. Lane. 1982, 14p LA-UR-81-3017, CONF-820701-1
Contract W-7405-ENG-36
Symposium of the International Association of Hydrological Sciences, Exeter, UK, 19 Jul 1982.

A distributed hydrologic model for application on small, semiarid watersheds is developed. The distributed model incorporates simplified routing schemes to include the influence of transmission losses on runoff. A sediment transport model, by sediment size fractions, is developed to compute transport capacity and sediment yield in noncohesive, alluvial channels. Based on available information published in soils and topographic maps and on channel and bed sediment characteristics, the procedure is used to estimate runoff rates and amounts together with sediment yields from semiarid watersheds. Example applications include flood frequency analysis and sediment yield. The procedure requires a minimum of observed data for calibration and is designed for practical applications. (ERA citation 07:048267)

DE82013540 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Multidimensional Model for Simulating Moisture and Thermal Transport in Unsaturated Aquifer Systems.
G. T. Yeh, and R. J. Luxmoore. 1981, 11p CONF-810477-4
Contract W-7405-ENG-26
12. modeling and simulation conference, Pittsburgh, PA, USA, 30 Apr 1981.

This paper presents the development of a multi-dimensional model for simulating moisture and thermal transport in an unsaturated aquifer system using the integrated compartment method (ICM). The entire unsaturated zone is divided into a number of compartments with different sizes and shapes. The Philip-de Vries equation governing moisture movement and heat transfer are integrated over each of the compartments to yield a system of nonlinear ordinary differential equations. The system is then solved by one of three optional time integration schemes: the split explicit, the implicit point wise iteration, and the matrix inversion iteration schemes. The model is verified by comparing its simulations with those of known analytical computations for simplified cases. Results indicate that the ICM algorithm can indeed simulate moisture movement and heat transfer in accordance with the Philip-de Vries equations. Validation of the model is under further investigation.

N82-29776/3 PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Image Processing Developments and Applications for Water Quality Monitoring and Trophic State Determination.
R. J. Blackwell. 1 Mar 82, 98p NASA-CR-169139, JPL-PUBL-82-4
Contract NAS7-100

Remote sensing data analysis of water quality monitoring is evaluated. Data anaysis and image processing techniques are applied to LANDSAT remote sensing data to produce an effective operational tool for lake water quality surveying and monitoring. Digital image processing and analysis techniques were designed, developed, tested, and applied to LANDSAT multispectral scanner (MSS) data and conventional surface acquired data. Utilization of these techniques facilitates the surveying and monitoring of large numbers of lakes in an operational manner. Supervised multispectral classification, when used in conjunction with surface acquired water quality indicators, is used to characterize water body trophic status. Unsupervised multispectral classification, when interpreted by lake scientists familiar with a specific water body, yields classifications of equal validity with supervised methods and in a more cost effective manner. Image data base technology is used to great advantage in characterizing other contributing effects to water quality. These effects include drainage basin configuration, terrain slope, soil, precipitation and land cover characteristics.

PB82-263641 PC **A05**/MF **A01**
Geological Survey, Albuquerque, NM. Water Resources Div.
Results of Hydrologic Tests and Water-Chemistry Analyses, Wells H-5A, H-5B, and H-5C, at the Proposed Waste Isolation Pilot Plant Site, Southeastern New Mexico.
Water-resources investigations (Final),
Kevin F. Dennehy, and Jerry W. Mercer. Feb 82, 96p USGS/WRI-82-19, USGS/WRD/WRI-82-021
Prepared in cooperation with Department of Energy, Washington, DC.

Data were collected during hydrologic testing at wells H-5A, H-5B, and H-5C in the northeastern part of the proposed Waste Isolation Pilot Plant site in southeastern New Mexico. The three water-bearing zones tested, the Magenta and Culebra Dolomite Members of the Rustler Formation and the Rustler Formation-Salado Formation contact, yield water to wells at rates less than 0.6 gallon per minute. Throughout the testing, water-pressure response in the tested zone was monitored by a pressure-transducer system. Dissolved-solids concentrations in water samples were: (1) Magenta Dolomite Member, 6,090 milligrams per liter; (2) Culebra Dolomite Member, 144,000 milligrams per liter; and (3) Rustler Formation-Salado Formation contact, 412,000 milligrams per liter. The major chemical constituents of water samples from the Magenta Dolomite Member were sodium and sulfate; from the Culebra Dolomite Member, sodium and chloride; and from the Rustler Formation-Salado Formation contact, magnesium and chloride. Radium-226, a naturally oc-

curring radioactive element, was present in samples from all three zones.

PB82-264953 PC **A03**/MF **A01**
Geological Survey, Albuquerque, NM. Water Resources Div.
Techniques for Estimating Flood Discharges for Unregulated Streams in New Mexico.
Water-resources investigations (Final),
Richard P. Thomas, and Robert L. Gold. Mar 82, 49p USGS/WRI-82-24, USGS/WRD/WRI-82-062
Prepared in cooperation with New Mexico State Highway Dept., Santa Fe and Federal Highway Administration, Washington, DC.

Equations for estimating flood magnitudes at selected recurrence intervals from 2 to 500 years were developed using multiple-regression analyses. These equations relate flood magnitudes to basin characteristics, contributing drainage area, and site altitude, and only are applicable to unregulated streams in New Mexico that are relatively unaffected by urban runoff. Flood estimates at gaged sites are computed using a separate estimating equation. This equation adjusts discharges developed from the original regression equations using flood magnitude and frequency values at the gaged site.

PB82-811381 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Stream Erosion and Scouring Processes. 1964-August, 1982 (Citations from the NTIS Data Base).
Sep 82, 218p
Supersedes PB81-807232 and PB80-808231.

Studies on erosion or scouring processes and actions of rivers and streams are cited. Erosion of stream banks, bridge supports, levees, and other hydraulic structures are covered. Reports only concerned with sediment transport and erosion from surface runoff are excluded. (This updated bibliography contains 209 citations, 51 of which are new entries to the previous edition.)

8I. Mining Engineering

DE82005741 MF **A01**
Alabama Univ. in Birmingham.
Assessment of the Geothermal/Geopressure Potential of the Gulf Coastal Plan of Alabama. Final Report.
G. V. Wilson, G. C. Wang, E. A. Mancini, and D. J. Benson. 1980, 278p DOE/ET/27015-T1
Contract AS05-79ET27015
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Geothermal and geopressure as well as geologic and geophysical data were studied to evaluate the potential for future development of geothermal resources underlying the Alabama Coastal Plain. Wire-line log data compiled and interpreted from more than 1300 oil and gas test wells included maximum recorded temperatures, mud weights, rock resistivities as related to geopressure, formation tops, fault locations, and depths to basement rock. The Alabama Coastal Plain area is underlain by a conduction dominated, deep sedimentary basin where geothermal gradients are low to moderate (1.0 to 1.8 exp 0 F/100 feet). In some areas of southwest Alabama, abnormally high temperatures are found in association with geopressured zones within the Haynesville Formation of Jurassic age; however, rocks of poor reservoir quality dominate this formation, with the exception of a 200-square-mile area centered in southernmost Clarke County where a porous and permeable sand unit is encased within massive salt deposits of the lower Haynesville. The results of a petrograhic study of the Smackover Formation, which underlies the Haynesville, indicate that this carbonate rock unit has sufficient porosity in some areas to be considered a potential geothermal reservoir. Future development of geothermal resources in south Alabama will be restricted to low or moderate temperature, non-electric applications, which constitute a significant potential energy source for applications in space heating and cooling and certain agricultural and industrial processes. (ERA citation 07:053505)

DE82006214 PC **A07**/MF **A01**
Mathtech, Inc., Princeton, NJ.
Design and Evaluation of Cross-Ridge Mountaintop Mining. Technical Progress Report as of February 28, 1981.
R. L. Lappi. Mar 81, 147p DOE/ET/13354-2
Contract AC22-76ET13354
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This report describes activities undertaken and progress achieved under Contract DE-AC22-76ET13354, Design,Evaluation and Demonstration of Cross-Ridge Mountaintop Mining, during the period February 1980 through February 1981. The objective of this contract is to plan, engineer, and monitor the performance of a cross-ridge mountaintop mining operation. This report discusses the activities that occurred during the subject period on the following tasks: Mapping, Reserve Analysis, Mine Planning, Environmental Monitoring, Economic Monitoring, and Permitting.

DE82008065 MF **A01**
TRW Defense and Space Systems Group, Redondo Beach, CA.
Study of the Geothermal Reservoir Underlying the East Mesa Area, Imperial Valley, California. Volume 2. Final Report Appendices.
Dec 76, 273p DOE/ET/28444-T3-V.2(FinalApp.)
Contract AC03-76ET28444
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The following appendices are included: East Mesa subsurface geology and well design; heat flow and subsurface temperature distribution; fluid and thermal contents; pressure testing of wells; reservoir simulation studies; well design and injection pump requirements; reservoir simulation description; gamma and neutron logs; and seismic, temperature, and pressure surveys. (ERA citation 07:053504)

DE82009715 PC **A04**/MF **A01**
Los Alamos National Lab., NM.
Analysis of Alternative Responses to Mining Subsidence Hazards: Current Status and Future Direction.
D. A. Rapp, J. M. Greenwood, J. Goetzinger, D. Oberhettinger, and C. A. Stroup. Feb 82, 63p LA-9239-MS
Contract W-7405-ENG-36
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The magnitude of the problem of coal-mined-land subsidence is only beginning to be recognized, as the collapse of overburden completes its insidious migration to the land surface and very often damages the manmade structures at or just below the surface. This report examines the magnitude and the consequences of the problem throughout the underground mining regions of the US. Such problems have produced a complex array of case laws that have produced a nebulous history of legal interpretations of property rights and adjudication of liability. The study identifies seven research activities that are needed to help solve these problems and to evaluate alternative response options. These are: socioeconomic impact assessment; data acquisition; instrumentation monitoring techniques; subsidence prediction; subsidence damage prediction; subsidence control and damage abatement; and technology transfer. Each activity category is described in the context of its place in an overall research and development program. The categories then are presented in a series of matrices along with specific assessment methods and data required to conduct the research activities. These matrices may be used as an initial means of identifying priorities for future research and development efforts. (ERA citation 07:045610)

DE82012341 PC **E04**/MF**$5.80**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
National Uranium Resource Evaluation Program. Data Report: Arkansas, Louisiana, Mississippi, Missouri, Oklahoma, and Texas. Hydrogeochemical and Stream Sediment Reconnaissance.
W. M. Fay, K. A. Sargent, and J. R. Cook. Feb 82, 38p GJBX-104-82, DPST-81-146-24
Contract AC09-76SR00001
Includes 15 sheets of 48x reduction microfiche.

This report presents the results of ground water, stream water, and stream sediment reconnaissance in Arkansas, Louisiana, Mississippi, Missouri, Oklahoma, and Texas. The following samples were collected: Arkansas-3292 stream sediments, 5121 ground waters, 1711 stream waters; Louisiana-1017 stream sediments, 0 ground waters, 0 stream waters; Mississippi-0 stream sediments, 814 ground waters, 0 stream waters; Missouri-2162 stream sediments, 3423 ground waters 1340 stream waters; Oklahoma-2493 stream sediments, 2751 ground waters, 375 stream waters; and Texas-279 stream sediments, 0 ground waters, 0 stream waters. Neutron activation analyses are given for U, Br, Cl, F, Mn, Na, Al, V, and Dy in ground water and stream water, and for U, Th, Hf, Ce, Fe, Mn, Na, Sc, Ti, V, Al, Dy, Eu, La, Sm, Yb, and Lu in sediments. The results of mass spectroscopic analysis for He are given for 563 ground water sites in Mississippi. Field measurements and observations are reported for each site. Oak Ridge National Laboratory analyzed sediment samples which were not analyzed by Savannah River Laboratory neutron activation.

DE82012436 PC **A03**/MF **A01**
Department of Energy, Bartlesville, OK. Bartlesville Energy Technology Center.
Impact of Geologic Parameters on Enhanced Oil Recovery - Workshop Proceedings.
M. Peterson. May 82, 46p CONF-8110160-
Conference on the impact of geologic parameters on enhanced oil recovery, Tulsa, OK, USA, 15 Oct 1981.

The purpose of this workshop is to identify and develop objectives for future geologic research needed to increase light oil production with the enhanced oil recovery processes and to identify quantitative studies with potential to predict the impact reservoir heterogeneities on the light oil recovery processes. With these goals in mind, four workshop groups were organized to discuss and develop a conceptual R and D program to minimize the geologic constraints to E.O.R. These workshop groups will provide guidance and input into DOE's light oil research program and will help decide where time and resources are most effectively utilized. Working groups studied: (1) rock-fluid interactions; (2) reservoir heterogeneity; (3) reservoir description; and (4) geologic imput into EOR simulation studies. The question addressed is whether the present technology is adequate to quantitatively define each of these areas for predictive uses. If it is not, what techniques and instrumentation is necessary to define these for each EOR process.

DE82013029 PC **A02**/MF **A01**
TRW, Inc., McLean, VA.
Data Base for Hydraulically Stimulated Gas Wells Producing from Tight Sands Formations.
Mar 82, 14p DOE/MC/16554-1172
Contract AC21-81MC16554

A data base was assembled in 1978 consisting of well records from more than 900 hydraulically fractured wells in the Piceance, Uinta, Washakie, Sand Wash, and Denver Basins. The purpose of the present study is to develop a western gas sand computerized data base for hydraulically stimulated gas wells by adapting and expanding the above-mentioned data file. This report describes the data file, tasks accomplished to date, and a sample well record.

DE82013573 PC **A02**/MF **A01**
Institute of Gas Technology, Chicago, IL.
Effect of Confining Pressure on Pore Volume in Tight Sandstones.
K. Sampath. May 82, 12p DOE/BC/00042-40
Contract AC19-78BC00042
Microfiche only after original copies are exhausted.

The effect of confining pressure on the pore volume of some tight sandstones from the Uinta Basin, Utah, was investigated. A new method based on the pressure-volume relationships of a gas was developed and used to measure pore volume reduction. The results were compared with the results obtained using the more common method that involves the measurement of liquid expelled from a saturated core and were found to be in good agreement. Pore volume compressibility of the samples studies is in the range of values reported by other investigators and ranges from 2.0 x 10 exp

-6 to 1.3 x 10 exp -5 pv/pv/psi at a confining pressure of 5,000 psi.

DE82013694 MF **A01**
Texas A and M Research Foundation, College Station.
Geotechnical Studies Related to in-Situ Lignite-Gasification Trials. Semiannual Technical Report, October 1, 1981-March 31, 1982.
E. R. Hoskins, and J. E. Russell. Mar 82, 156p DOE/PC/30221-T2
Contract FG22-80PC30221
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The Petroleum Engineering Department at Texas A and M University (TAMU) has conducted field tests on in situ gasification of lignite first at the Easterwood site near the main campus during 1978 and more recently at the Rockdale site adjacent to the Sandow Mine near the town of Rockdale in Milam County, Texas. The present project is related to the gasification trials at the Rockdale site. The objective of the current study is to investigate those geothechnical factors that may influence the performance of the in situ gasification process. These factors include: (1) preexisting fracture patterns in the lignite and their influence on permeability, (2) strength and deformability of the obverburden materials and how these properties are changed by the gasification process and their relationship to subsidence, and (3) the size, shape and orientation of cavities produced by the process and their relationship to local fracture patterns and geologic structure. The current study is necessarily site specific and related to the Rockdale site. Ultimately, the goal is to develop models that would be adaptable to any site with a minimum amount of site-specific investigation.

DE82014216 MF **A01**
Bendix Field Engineering Corp., Grand Junction, CO. Grand Junction Operations.
Description and Interpretation of Test Cores: Brooks and Adjacent Counties, South Texas.
W. E. Galloway, and D. A. Morton. Mar 82, 92p GJBX-9(82)
Contract AC13-76GJ01664
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

This report reviews the results of an examination of approximately 700 feet of core collected during a regional drilling program conducted under the National Uranium Resource Evaluation Program. Location of cored test borings is shown in Figure 1. Core depths ranged from 380 to 2905 feet, and included portions of the Catahoula (Oligocene), Oakville/Fleming (Miocene) and Goliad (Pliocene) Formations, all of which are significant uranium hosts in the South Texas Uranium Province. Objectives of the examination included: (1) description and interpretation of sedimentologic features; (2) description and interpretation of alteration facies; (3) mineralogic analysis of selected representative samples; (4) correlation of drill logs and core intervals within the framework developed in the course of regional stratigraphic studies; and (5) geochemical analysis of selected samples to assess alteration mineralogy and trace metals content. Mineralization potential of the study area for each formation is assessed as follows: Catahoula Formation - moderate to high potential for development of medium to large (10 exp 6 to 10 exp 7 lbs U sub 3 O sub 8 reserve) deposits; Oakville Formation - moderate to high potential for development of medium (10 exp 6 lbs U sub 3 O sub 8 reserves) deposits; Fleming Formation - low to moderate potential for development of small to medium (10 exp 5 to 10 exp 6 lbs U sub 3 O sub 8 reserves) deposits; Goliad Formation - moderate potential for development of small to medium (10 exp 5 to 10 exp 6 lbs U sub 3 O sub 8 reserves) deposits. (ERA citation 07:042379)

DE82014286 MF **A01**
Idaho Univ., Moscow. Coll. of Mines and Earth Resources.
Hydrochemistry of Selected Parameters at the Raft River KGRA, Cassia County, Idaho.
D. L. Graham, D. R. Ralston, and D. W. Allman. Jan 81, 126p DOE/ID/01638-1
Contract AS07-76ID01638
Portions of document are illegible.
Available in microfiche only.

Low to moderate temperature (< 150 exp 0 C) geothermal fluids are being developed in the southern Raft River Valley of Idaho. Five deep geothermal wells ranging in depth from 4911 feet to 6543 feet (1490 to 1980 meters) and two intermediate depth (3858 feet or 1170 meters) injection wells have been drilled within the Raft River KGRA. Several shallower (1423-500 feet or 430-150 meters) wells have also been constructed to monitor the environmental effects of geothermal development of the shallower aquifer systems. Sampling of water from wells within the KGRA has been conducted since the onset of the project in 1974. Five analytical laboratories have conducted analyses on waters from the KGRA. Charge-balance error calculations conducted on the data produced from these laboratories indicated that data from three laboratories were reliable while two were not. A method of equating all data was established by using linear regression analyses on sets of paired data from various laboratories. The chemical data collected from the deep geothermal wells indicates that a two reservoir system exists within the Raft River KGRA. Each reservoir is associated with a major structural feature. These features are known as the Bridge Fault System (BFS) and the Narrows Structure. (ERA citation 07:043077)

DE82014287 MF **A01**
Geological Survey, University, AL.
Second Quarter Report (FY82) on the Peat Resources Estimation in Alabama.
R. L. Barnett. Apr 82, 18p DOE/FC/10501-T1
Contract FG18-81FC10501
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Figure 1 shows the general locations of eight (8) areas in Mobile and Baldwin Counties that have demonstrated potential fuel-grade peat resources through reconnaissance field work and chemical analyses. Hollingers Island was the only known Alabama peat deposit prior to the current project effort. The initial research of this area was conducted in 1940 and has since been covered with fill material for construction of an industrial complex. The other seven (7) areas illustrated on figure 1 are peat deposits located during the current cooperative program and preliminary findings are discussed below. The Chickasaw and North Mobile deposits were explored by widely spaced drilling. The remaining deposits are prospects where additional exploration is in progress or proposed. With the exception of the Gulf Shores peat, these deposits are in large swamps that have been prospected in very few areas and all conclusions are based on relatively few drill holes.

DE82014499 MF **A01**
Colorado Univ. at Denver. Dept. of Civil and Urban Engineering.
Effect of Elevated Temperatures on Uniaxial Creep of Oil Shale. Final Report.
N. Y. Chang. Mar 82, 113p DOE/ET/12226-T1
Contract FG01-78ET12226
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

This report presents the results of investigations on the effects of elevated temperatures on the strength and creep of oil shale of different grades for evaluating the stability of oil shale mine structures and the associated ground subsidence in the underground mining, surface mining, in-situ and modified in-situ shale oil recovery processes. Uniaxial tests were conducted to determine the stress-strain-strength properties of oil shale under elevated temperatures. Preliminary results indicated that both the strength and the stiffness (Young's modulus) of oil shale decreased substantially when temperatures were increased from 7 to 450 exp 0 F. Uniaxial creep tests were performed under different combinations of stress levels and temperatures. Test results showed that the creep rate was extremely sensitive to the temperature and stress variation. A rheological model, a three-parameter Kelvin-Voight model, was adopted to simulate the uniaxial creep behavior of oil shale. The simulated creep behavior was in good agreement with experimental results. A rock structure creeps under all stress and temperatures. Upon any temperature increase, the creep strain rate increases due to the resulting strength reduction and deformability increase. This increase in temperatures and creep strain rate may cause rock structure primary or secondary creep to quickly reach the tertiary creep state. During tertiary creep, the deformation of rock takes place at an ever increasing rate due to the continuous weakening of rocks caused by the development of microcracks. The process would continue until the rock fails unless the stress and/or temperature change. Once a mine structure enters the tertiary creep state, its failure is imminent. Preliminary results indicated that the on-set time, rupture time and tertiary creep life are strongly dependent on the stress ratio, temperature, secondary creep rate, and oil shale grade.

DE82014582 MF **A01**
Williams Bros. Urban Ore, Inc., Tulsa, OK.
Assessment of Underground Coal Gasification in Butuminous Coals: Catalog of Bituminous Coals and Site Selection. Appendix B. UCG Amenable Bituminous Resource Data Base. Final Report, Phase I. Volume II of IV, Book 4 of 4.
31 Jan 82, 107p DOE/MC/14584-1193-V.2-Bk.4
Contract AC21-80MC14584
Portions of document are illegible.
Best availablecopy from document source. Available in microfiche only.

This document contains estimates of bituminous coal resources amenable to underground coal gasification in the contiguous 48 states. Maps showing location of amenable resources in the various states accompany the resource estimates. This work was completed under US Department of Energy Contract DE-AC21-80MC14584. Instructions for use of this document are contained in Section 3.5.3 of the Phase I Report (Assessment of Underground Coal Gasification in Bituminous Coals), prepared under the same contract. That section of the Phase I Report should be refeerred to prior to using this resource catalog, particularly when using estimates of UCG amenable resources in western states. The summary sheet located in the front of this resource catalog smmarizes UCG amenable resources by state, on the basis of land ownership. Analysis of resource data indicates presence of UCG amenable resources in 10 states. Six of these states are located in the eastern US and have traditionally been major coal producing states. The UCG resource data presented is intended for use in identifying areas where resources appear to meet the criteria described in the Phase I Report. Prior to selecting any sit(s) for UCG development, additional field drilling will be necessary to verify resource estimates.

DE82014584 PC **A06**/MF **A01**
Williams Bros. Engineering Co., Tulsa, OK. Process Div.
Assessment of Underground Coal Gasification in Bituminous Coals. Volume I. Executive Summary. Final Report.
1981, 117p DOE/MC/14584-1193-V.1
Contract AC21-80MC14584
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This report describes the bituminous coal resources of the United States, identifies those resources which are potentially amenable to Underground Coal Gasification (UCG), identifies products and markets in the vicinity of selected target areas, identifies UCG concepts, describes the state of the art of UCG in bituminous coal, and presents three R and D programs for development of the technology to the point of commercial viability. Of the 670 billion tons of bituminous coal remaining in-place as identified by the National Coal Data System, 32.2 billion tons or 4.8% of the total are potentially amenable to UCG technology. The identified amenable resource was located in ten states: Alabama, Colorado, Illinois, Kentucky, New Mexico, Ohio, Oklahoma, Utah, Virginia, and West Virginia. The principal criteria which eliminated 87.3% of the resource was the minimum thickness (42 inches). Three R and D programs were developed using three different concepts at two different sites. Open Borehole, Hydraulic Fracture, and Electrolinking concepts were developed. The total program costs for each concept were not significantly different. The study concludes that much of the historical information based on UCG in bituminous coals is not usable due to the poor siting of the early field tests and a lack of adequate diagnostic equipment. This information gap requires that much of the early work be redone in view of the much improved understanding of the role of geology and hydrology in the process and the recent development of analytical tools and methods. (ERA citation 07:042035)

DE82014891 PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.

Oil Mining: A Review with Recommended R and D in the Federal Sector.
I. Y. Borg. 5 May 82, 27p UCID-19379
Contract W-7405-ENG-48
Microfiche only after original copies are exhausted.

There is currently a high interest in oil mining as a possible future recovery technique for oil remaining in depleted fields or virgin fields otherwise unamenable to conventional recovery techniques. This review suggests that the mining options are largely untried, high risk and high cost options that only in special instances are likely to attract private risk capital. Open pit mining of shallow, depleted fields preferably containing light crude oils with high residual oil saturations appears to have potential in supplying some part of the nation's future oil requirements. The environmental aspects and recovery techniques appropriate to mining technology are virtually unassessed. This and other suggested mining technologies merit closer examination on both technical and economic grounds. There appear to be R and D opportunities for the government sector that are synergistic with current programs at the Lawrence Livermore National Laboratory.

DE82014897 MF **A01**
Alabama Dept. of Energy, Montgomery.
Regional Resource Assessment and Feasibility Analysis of Fossil Energy Recovery from Chattanooga (Devonian) Oil Shale in Alabama and Adjacent States: Report of Phase I Investigations.
3 Jun 81, 113p DOE/R4/10200-T1
Contract FG44-80R410200
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The primary objective of this project was to assess the resource potential and economic feasibility of recovering synthetic hydrocarbons, uranium and other by-products from the Devonian Chattanooga Shale in Alabama and adjacent states. Phase I of the proposed multiphase project consisted essentially of the following investigative elements: regional surface sampling; site-specific core drilling; Fischer assays, proximate analyses, oxide analyses, trace element analyses; economic feasibility of the Paraho and HYTORT processes in light of data from the above; and preliminary evaluation of commercialization potential of innovative processes such as liquefaction of oil shale with liquid catalysts. The results of work completed in Phase I allow the following conclusions to be drawn: within the context of the quantities of hydrocarbons found in this project and within the limitations of the accuracy of existing cost data for currently available retorting technology, it is apparent that commercialization of oil shale in the study area is not feasible at current world prices for conventional crude. The liquefaction (by liquid catalysts) of oil shales of the study area, with their characteristically low hydrogen-carbon ratios, is a promising novel method for recovering oil from eastern shale deposits, but further research to determine its commercial applicability is required. The ultimate viability of an oil shale industry in Alabama and adjacent states may depend upon the combined results of oil price escalations, more exploration and testing to delineate the highest quality deposits, and continued research on improving hydrocarbon and by-product recoveries.

DE82015187 MF **A01**
Lawrence Livermore National Lab., CA.
Continental Scientific Drilling Program Data Base: 1982.
G. A. Pawloski, N. Howard, G. Hage, 18 May 82, 12p UCRL-87643, CONF-820556-1
Contract W-7405-ENG-48
International conference on geologic information, Golden, CO, USA, 24 May 1982, Portions of document are illegible.
Available in microfiche only.

The Continental Scientific Drilling Program (CSDP) data base maintained at Lawrence Livermore National Laboratory is funded by the Office of Basic Energy Sciences of the Department of Energy. It is a central repository of information concerning approximately 1800 government funded and scientifically interesting drill holes in the United States. This data base can help reduce drilling costs and maximize scientific value of drilling efforts of government agencies and industry. The services of the CSDP data base are free of charge and available to all. (ERA citation 07:048277)

DE82015392 PC **A03**/MF **A01**
Department of Energy, Bartlesville, OK. Bartlesville Energy Technology Center.
Silica Gel as a Model Surface for Adsorption Calorimetry of Enhanced-Oil-Recovery Systems.
L. A. Noll, and T. E. Burchfield. Jun 82, 50p DOE/BETC/RI-82/7

This report describes a method for studying interaction of fluids with surfaces by measuring the heat of immersion and then measuring simultaneously the surface excess and enthalpy of replacement for a series of binary solutions. The method of calculating surface excess is described. These techniques are applied to silica gel which has had different activation temperatures. Heating overnight to 400 exp 0 C results in a reproducible surface. The adsorption of n-butyl alcohol from toluene and from water upon these surfaces is compared. (ERA citation 07:045682)

DE82015399 PC **A05**/MF **A01**
Tulsa Univ., OK.
Rheology of Foam and its Implictions in Drilling and Cleanout Operations.
V. Sanghani, and C. U. Ikoku. Jun 82, 100p DOE/BC/10079-47
Contract AC19-79BC10079

Experimental analysis was carried out to study the rheological properties of foam. Foam was generated by simultaneously injecting air and an aqueous solution of the foaming agent through a coiled tubing foam generator. Foam was injected at the bottom of an annulus with 4.0 in. (I.D.) casing diameter and 1.5 in. (O.D.) tubing diameter. Qualities ranged from 0.65 to 0.95. Shear rates ranged from 150 to 1000 sec exp -1 . Effective viscosities were calculated and were found to range from 60 to 500 cps. Results showed that flowing foam behaved as a pseudo plastic fluid with no yield value; effective foam viscosity decreased with an increase in shear rate for a fixed quality. For shear rates in the range 500 sec exp -1 to 1000 sec exp -1 , the effective foam viscosity was independent of foam quality. This is useful since most field applications fall in this range. (ERA citation 07:045678)

DE82015481 PC **A06**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Sandia Heavy-Oil Subprogram FY81 Annual Report.
J. R. Wayland. Mar 82, 104p SAND-81-2497
Contract AC04-76DP00789
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The Sandia National Laboratories Heavy Oil Program is concerned with reservoir access, as defined in the Department of Energy Heavy Oil Program Plan. The program is divided into two major areas: (1) drilling technology and (2) well completions, physical stimulations, and downhole steam production. This report documents the activities in those areas from 1 October 1980 to 30 September 1981.

DE82015485 MF **A01**
Gruy Federal, Inc., Houston, TX.
Field Project to Obtain Pressure Core, Wireline LOG, and Production Test Data for Evaluation of CO sub 2 Flooding Potential, Conoco MCA Unit Well No. 358, Maljamar Field, Lea County, New Mexico.
T. E. Swift, R. E. Marlow, M. H. Wilhelm, J. H. Goodrich, and R. M. Kumar. Nov 81, 239p DOE/MC/08341-T1
Contract AC21-79MC08341
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

This report describes part of the work done to fulfill a contract awarded to Gruy Federal, Inc., by the Department of Energy (DOE) on Feburary 12, 1979. The work includes pressure-coring and associated logging and testing programs to provide data on in-situ oil saturation, porosity and permeability distribution, and other data needed for resource characterization of fields and reservoirs in which CO sub 2 injection might have a high probability of success. This report details the second such project. Core porosities agreed well with computed log porosities. Core water saturation and computed log porosities agree fairly well from 3692 to 3712 feet, poorly from 3712 to 3820 feet and in a general way from 4035 to 4107 feet. Computer log analysis techniques incorporating the a, m, and n values obtained from Core Laboratories analysis did not improve the agreement of log versus core derived water saturations. However, both core and log analysis indicated the ninth zone had the highest residual hydrocarbon saturations and production data confirmed the validity of oil saturation determinations. Residual oil saturation, for the perforated and tested intervals were 259 STB/acre-ft for the interval from 4035 to 4055 feet, and 150 STB/acre-ft for the interval from 3692 to 3718 feet. Nine BOPD was produced from the interval 4035 to 4055 feet and no oil was produced from interval 3692 to 3718 feet, qualitatively confirming the relative oil saturations as calculated. The low oil production in the zone from 4022 to 4055 and the lack of production from 3692 to 3718 feet indicated the zone to be at or near residual waterflood conditions as determined by log analysis. This project demonstrates the usefulness of integrating pressure core, log, and production data to realistically evaluate a reservoir for carbon dioxide flood. (ERA citation 07:045688)

DE82015516 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Laboratory Evaluation of Polyurethane Foam for Geothermal Lost-Circulation Plugging.
E. Tschoepe, III. Apr 82, 40p SAND-81-7227
Contract AC04-76DP00789
Portions of document are illegible.
Microfiche only after original copies are exhausted.

To evaluate polyurethane foam formulations for use in plugging hot (such as geothermal) formations when lost circulation is encountered during drilling, laboratory tests of three foams were performed. Foams were mixed at high temperature (up to 300 exp 0 F) and high pressure (up to 900 psig); the mechanical and fluid loss properties of the foams were subsequently determined. The results show that polyurethane foams can be mixed at downhole conditions and yield acceptable plugging properties.

DE82015683 PC **A17**/MF **A01**
Foster-Miller Associates, Inc., Waltham, MA.
Development of a High Capacity Longwall Conveyor. Final Technical Report.
C. Sparks. May 82, 376p DOE/ET/12496-T4
Contract AC22-75ET12496
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The objectives of this program were to develop, fabricate, and demonstrate a longwall conveying system capable of transporting coal at a rate of 9000 tons/day (1000 tons/hr) and capable of accommodating a surge rate of 20 tons/min. The equipment was required to have the structural durability to perform with an operating availability of 90%. A review of available literature and discussions with longwall operators identified the problem areas of conveyor design that required attention. The conveyor under this contract was designed and fabricated with special attention given to these areas, and also to be easily maintainable. The design utilized twin 300 hp drives and twin inboard 26-mm chain at 270 ft/min; predictions of capacity and reliability based on the design indicating that it would satisfy the program requirements. Conveyor components were critically tested and the complete conveyor was surface-tested, the results verifying the design specifications. In addition, an instrumentation system was developed with analysis by computer techniques to monitor the performance of the conveyor. The conveyor was installed at a selected mine site, and it was the intention to monitor its performance over the entire longwall panel. Monitoring of the conveyor performance was conducted over approximately one-third of the longwall panel, at which point further effort was suspended. (ERA citation 07:049119)

DE82016043 MF **A01**
Mountain West Research, Inc., Billings, MT.
Fact Book for Western Coal/Energy Development.
Jan 79, 564p DOE/NBM-2016043
Best available copy from document source. Available in microfiche only.

The Western Coal Planning Assistance Project (WCPAP) was designed to help state and local planners and decision-makers develop the technical methods and information needed to cope with the problems associated with coal/energy development. Since the United States has begun to move toward conversion of industrial energy resources from oil and natural gas

to coal in order to become less dependent on foreign energy sources and with a concurrent commitment to reduce air pollution, development of strippable, low sulphur coal reserves is accelerating. The impacts of this movement are already being felt in the North Great Plains and adjacent portions of the Rocky Mountain and Midwestern States, where the nation's largest proven reserves of coal are found. The project encompasses the major coal areas of Montana, North Dakota, and Wyoming. The project consists of two major tasks: (1) the development of a Planning Reference System for planners and decision-makers, and (2) a detailed assessment of planning problems and needs in the three states. The latter appears in WCFAP's Final Report (February 1979). The Fact Book informs the reader about a wide range of coal-related facts. Among the topics covered in the document are: existing coal fields and mines; coal-related facilities; transportation; legislation; and primary and secondary impacts. (ERA citation 07:042191)

DE82016044 MF **A01**
University of Southwestern Louisiana, Lafayette.
Subsurface and Seismic Investigation of the Geopressured-Geothermal Potential of South Louisiana. Part I: the Abbeville Area, September 1, 1978-October 31, 1980.
W. R. Paine, G. L. Kinsland, M. P. Duhon, and J. R. Dungan. 1980, 138p DOE/ET/27161-1
Contract AS05-78ET27161
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The structure investigated is a basin roughly bounded by the Abbeville Dome on the West, the Erath Dome on the Southeast and the Grosse Isle Dome on the Northeast and whose center is located at approximately Section 31 T14S R4E. The geopressured sands investigated are below approximately 12,800 feet (3901 M) in the center of the basin and consist of two groups of rather thin, discontinuous, marly sands. These two groups, rather arbitrarily defined, are termed the upper and lower geopressured sands and the following map types and analyses have been derived from subsurface data of each: structure, temperature, pressure, salinity and net sand maps; and porosity, permeability and methane content analyses. The Reservoir analysis was accomplished by the use of wire line surveys (electric logs) and computer analyses based on standard relationships found in Schlumberger manuals. Seismic analysis proved to be an invaluable tool in establishing the structure of the area. (ERA citation 07:046450)

DE82903077 PC **A04**/MF **A01**
CACI, Inc.-Federal, Arlington, VA.
Transportation Network Models for Energy Supply Analysis. Volume 1. Executive Summary. Final Report.
W. H. Baxter, M. S. Bronzini, D. R. Limaye, and D. M. Sherman. Mar 82, 57p EPRI-EA-2324(V.1)
Portions of document are illegible.

Future coal transportation costs and capacities are examined within a multicommodity framework by employing a national multimodal transportation network model. The model was used to forecast energy transportation costs and to determine the impact of technology and network structure on energy transport supply. The hierarchical structure of the network model includes detailed models of individual freight service operations to produce estimates of node and link delay, energy use, and cost for use in the larger network model. The model was used to route origin-destination flows through the network using a minimum path algorithm with additional features such as commodity-specific costs and an equilibrium flow algorithm. A separate railroad routing model was used which has a path selection algorithm that considers rail line ownership as a path choice determinant. The models were used to analyze future energy transportation costs and capacities under baseline conditions for the years 1980, 1990, and 2000, and to investigate network changes such as proposed coal slurry pipelines and railroad mergers. The analyses revealed that coal transportation costs, in real terms, will increase one or two percent per year over the next two decades, and that substantial investments in new transportation capacity will be needed to accommodate anticipated coal movements. The model runs reflected the most accurate information available at the time the input data was developed, and any future applications of these findings should be tempered by changes in relative prices, costs and transportation technology that have occurred since that time. Other volumes in this series include: Volume 2 - methodology and scenario; Volume 3 - transportation network model user's guide and documentation; Volume 4 - transportation network model support programs; Volume 5 - appendixes. (ERA citation 07:042206)

DE82903078 MF **A01**
CACI, Inc.-Federal, Arlington, VA.
Transportation Network Models for Energy Supply Analysis. Volume 2. Methodology and Scenario. Final Report.
W. H. Baxter, M. S. Bronzini, T. C. Hough, D. R. Limaye, and D. M. Sherman. Mar 82, 139p EPRI-EA-2324(V.2)
Portions of document are illegible.
Available in microfiche only.

This report presents the findings of an analysis of transportation network changes and their effect on energy supply. The major emphasis was to develop computer capabilities for forecasting energy transportation costs and to determine the impact of technology and network structural changes on energy transport supply. Anticipated energy transportation performance for three specific scenarios, for the years 1980, 1990, and 2000, was examined, both to investigate the ability of the network to accommodate the future fuel transportation needs of the electric utilities and to predict changes in transportation cost, time, and energy use over this horizon. The analysis revealed that coal transportation costs, in real terms, will increase one or two percent per year over the next twenty years, and that substantial investment in new transportation capacity will be required to accommodate anticipated coal movements. Other volumes in this series include: Volume 1 - executive summary; Volume 3 - transportation network model user's guide and documentation; Volume 4 - transportation network model support programs; Volume 5 - appendixes. (ERA citation 07:042207)

DE82903079 MF **A01**
CACI, Inc.-Federal, Arlington, VA.
Transportation Network Models for Energy Supply Analysis. Volume 3. Transportation Network Model User's Guide and Documentation. Final Report.
W. H. Baxter, M. S. Bronzini, T. C. Hough, D. R. Limaye, and D. M. Sherman. Mar 82, 150p EPRI-EA-2324(V.3)
Portions of document are illegible.
Available in microfiche only.

This volume, prepared by CACI, Inc. Federal, presents the Transportation Network Model developed for EPRI. Complete model documentation is provided including discussions of program logic, input and output and program use. An overview is included wherein model purposes, features and applications are highlighted. Volume 4 of this report series describes several other computer programs that are used in conjunction with this model. Other volumes in this series include: Volume 1 - executive summary; Volume 2 - methodology and scenario; Volume 4 - transportation network model support programs; Volume 5 - appendixes. (ERA citation 07:042208)

DE82903858 MF **A01**
CACI, Inc.-Federal, Arlington, VA.
Transportation Network Models for Energy Supply Analysis. Volume 4. Transportation Network Model Support Programs. Final Report.
W. H. Baxter, M. S. Bronzini, T. C. Hough, D. R. Limaye, and D. M. Sherman. Mar 82, 106p EPRI-EA-2324(V.4)
Portions of document are illegible.
Available in microfiche only.

The Transportation Network Model requires two relatively large input data files. In addition, there are several large data files that are produced by the model. The programs described in this volume are used to manipulate, create, and extract data from these files. While none of these programs are required to run the TNM, they have all been found to be quite useful in both preparing for model runs and analyzing run results. The TNM Preprocessor described in Section 1 is certainly the most important of these programs. The preprocessor reads the network data prepared by the user, checks for errors and illogical system configurations, and outputs the network data file that is used by the TNM. Other programs are described that perform various functions including flow volume estimate changes, conversion of path files to fixed route shipment input, and implementation of a procedure to assure that all commodity flows are in equilibrium. A program to deaggregate flows to the BEA level is presented as is a program to generate unit train compatible coal flows. The data files produced by the TNM are used by several programs described here. These programs are used to determine the points of congestion on the network, and to create computer plots of networks and commodity flows. The final section describes the Railroad Routing Model in detail. This model routes shipments through a railroad network based on ownership of the links in the network. (ERA citation 07:042209)

NUREG/CR-2684 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Rock Riprap Design Methods and Their Applicability to Long-Term Protection of Uranium Mill Tailings Impoundments,
W. H. Walters. Aug 82, 86p PNL-4252

This report reviews the more accepted or recommended riprap design methods currently used to design rock riprap protection against soil erosion by flowing water. The basic theories used to develop the various methods are presented. The riprap design with safety factors method is identified as the logical choice for uranium mill tailings impoundments. This method is compared to the other methods and its applicability to the protection requirements of tailings impoundments is discussed. Other design problems are identified and investigative studies recommended.

PB82-256959 PC **A02**/MF **A01**
Bureau of Mines, University, AL. Tuscaloosa Research Center.
Recovery of High-Grade Barite from Waste Pond Materials.
Rept. of investigations/1982,
W. E. Lamont, and G. V. Sullivan. Jun 82, 19p BUMINES-RI-8673

The Bureau of Mines studied the potential for recovering marketable barite concentrates that meet oil well drilling-mud specifications from barite waste pond materials. The samples, which were obtained from Georgia, Nevada, Missouri, and Illinois, varied widely in character, particle size, and barite content. The samples were treated with sodium silicate and sodium cetyl-stearyl sulfate and then floated. The flotation flow sheet was modified to reject barren coarse and/or slime fractions from some of the samples, and one feed sample had to be scrubbed prior to flotation to remove residual flotation reagents. The cleaned concentrates had BaSO4 contents ranging from 95.0 to 96.9 percent, while recovering 81.2 to 95.9 percent of the barite in the feed. The specific gravity of each concentrate exceeded the specification of 4.2. The removal of the flotation reagents from the flotation concentrate was not investigated.

PB82-257163 PC **A02**/MF **A01**
Bureau of Mines, Avondale, MD. Avondale Research Center.
Application of a Photodiode Array Optical Spectrometer to the Study of the Incendivity of Light Alloys Impacting on Rusted Steel.
Rept. of investigations/1982,
T. J. Driscoll, D. R. Flinn, and W. C. Lederer. Jun 82, 22p BUMINES-RI-8684

Methane-air mixtures can ignite as a result of sparking or rubbing of materials, particularly by impact involving light alloys and rusted steel where an exothermic thermite reaction can occur. This report reviews the published literature and describes a new method utilized by the Bureau of Mines for studying the processes occurring during collisions of light metals with rusted steels. The method involves measuring the spectra of sparks and explosions in methane-air mixtures using a photodiode array. Initial results obtained using magnesium and aluminum alloy 6061-T651 projectiles striking rusted steel are reported.

PB82-257205 PC **A07**/MF **A01**
Booz-Allen and Hamilton, Inc., Cleveland, OH.
Machine Lighting Design for Coal Mine Applications.
Open file rept.
Mar 82, 132p BUMINES-OFR-107-82
Contract J0308009

The program consisted of three specific illumination assignments addressing low seam (under 42 in.) applications where particularly difficult lighting problems

have been identified. The specific assignments were development and evaluation of a viable illumination system for a very low seam longwall installation at Pittston Coal Company's Jewell Ridge Coal Corporation, Mine 12-A in Jewell Ridge Virginia. The longwall used mining progress (Westfalia) equipment, development and evaluation of low glare, factory integrated illumination system for Wilcox (Fairchild Inc.) Mark 20 and Mark 21 auger miners, and a survey of low seam mining machine manufacturers to assess needs for factory integrated (as compared to factory or field retrofitted) illumination system development.

PB82-259540 PC **E04**/MF **E04**
Commission of the European Communities, Luxembourg.
Etude sur la Propagation des Fractures Hydrauliques dans les Roches (Study on the Propagation of Hydraulic Fractures in Rocks).
Final rept.,
F. H. Cornet. 1981, 71p EUR-7287-FR
Text in French.
Customers in the European Community countries should apply to the Office for Official Publications of the European Communities, B.P. 1003, Luxembourg.

The possibility of forming multiple hydraulic links between two deep wells by means of hydraulic fracturing was investigated. Isotropic rocks and those whose fracture behavior is anisotropic were considered. A mathematical model showed that for isotropic rocks, the fractures should align progressively parallel to the direction of the maximum principal stress in relation to the well where they originated. Thus, the application of this technique for establishing multiple links between two deep wells appeared doubtful.

PB82-260803 PC **A02**/MF **A01**
Bureau of Mines, Twin Cities, MN. Twin Cities Research Center.
Failure Analysis of Diesel Exhaust-Gas Water Scrubbers.
Rept. of investigations/1982,
Robert W. Waytulonis, Sean D. Smith, and Lito C. Mejia. Jul 82, 25p BUMINES-RI-8682

The Federal Bureau of Mines contacted 29 organizations--mine maintenance departments and equipment manufacturers--concerning service experience and construction of diesel exhaust-gas water scrubbers. Scrubbers are used primarily on mobile diesel-powered mining equipment subject to 30 CFR 36. Because the scrubbers cool exhaust gas and act as flame arresters, their failure would compromise safety in underground mines. Scrubber maintenance problems and frequency and modes of failure were identified, and construction materials and techniques were evaluated. Sludge and mineral deposits and different types of corrosion and metal fatigue were identified as problems leading to scrubber failure. The corrosion process is explained; maintenance practices, construction materials, and manufacturing methods that could be used to reduce premature failures and allow longer effective scrubber life are identified; and basic changes in scrubber design are suggested.

PB82-260977 PC **A02**/MF **A01**
Bureau of Mines, University, AL. Tuscaloosa Research Center.
Beneficiation of a Phosphate Ore Produced by Borehole Mining.
Rept. of investigations/1982,
B. E. Davis, T. O. Llewellyn, and G. V. Sullivan. Jul 82, 16p BUMINES-RI-8681

As part of its program to increase the domestic availability of critical minerals, the Bureau of Mines conducted characterization and beneficiation studies on a St. Johns County, Fla., phosphate ore that was mined by borehole mining. Results revealed that the ore from this test mine was mostly sand-size carbonate-fluorapatite and quartz and contained 24.6 percent P2O5. Concentration by various flotation techniques produced phosphate concentrates that ranged, in percent, from 30.0 to 31.4 P2O5, 0.73 to 0.80 MgO, and 2.8 to 7.2 acid insoluble. Recovery of the phosphate from the ore ranged from 89.4 to 96.3 percent.

PB82-261983 PC **A03**/MF **A01**
Council for Mineral Technology, Randburg (South Africa).
Interactions Between Sulphide Minerals and Metal Ions in the Activation, Deactivation, and Depression of Mixed-Sulphide Ores.
S. A. Allison. 30 Apr 82, 41p MINTEK-M29

This report describes an investigation into the association between metal-salt species and sulphide-mineral surfaces. The conditions under which association occurs were established, and the rates and extent of reaction were measured for copper and lead salts and for pyrite, sphalerite, galena, chalcopyrite, bornite, covellite, chalcocite, and pyrrhotite. A survey of the literature on work in this area is included. The results suggest that some form of association is a common occurrence, and can take place in two forms. In some instances (galena, sphalerite, and pyrrhotite), the interaction is of the same type as the well-established mechanism of the activation of sphalerite by copper, i.e., exchange of an activating cation for a metal ion of the mineral lattice; in others, solid metal-hydroxy species are adsorbed at the mineral surface. The association of hydroxy species is found to be reasonably specific, in that they differ in their mode of occurrence and extent at different surfaces.

PB82-262460 PC **A07**/MF **A01**
Bendix Corp., Baltimore, MD. Environmental and Process Instruments Div.
Microprocessor TDR.
Open file rept. Jun 76-Apr 80,
W. C. Blanchard. Apr 80, 143p EIR-1362, BUMINES-OFR-135-82
Contract H0366020

Time domain reflectometry (TDR) is a remote sensing technique that uses active backscatter. The technique is applicable to testing for faults and multiple partial faults on cables. The battery-operated hardware developed during this study tailored this technique for testing mining equipment trailing electrical cables. Processing of the backscatter is accomplished using a microprocessor. The visual output from the hardware to the operator is the type, magnitude, and distance to the cable fault in a numerical format.

PB82-262759 PC **A03**/MF **A01**
Bureau of Mines, Albany, OR. Albany Research Center.
Chromium Recovery from Nickel-Cobalt-Laterite and Laterite Leach Residue.
Rept. of investigations/1982,
D. E. Kirby, D. R. George, and C. B. Daellenbach. Jul 82, 28p BUMINES-RI-8676

This report characterizes laterites and laterite leach residues. It describes a chromite recovery procedure using conventional industrial beneficiation equipment for sizing, low-intensity magnetic separation, and gravity concentration. Concentrates containing 20.0 to 22.4 pct Cr (29.0 to 32.7 pct Cr2O3) and with a 1.6:1 to 1.9:1 Cr-Fe ratio were recovered from laterites and residues containing 1.3 to 2.5 pct Cr with recoveries exceeding 50 pct. Because of their low grade and fine size, these concentrates would be suitable for preparing chromium chemicals. The direct beneficiation of laterites for chromite recovery resulted in the minerals containing nickel and cobalt concentrating in slime products. No iron oxide coproducts of acceptable grade were recovered from either laterites or residues.

PB82-262791 PC **A02**/MF **A01**
Bureau of Mines, Boulder City, NV. Boulder City Engineering Lab.
Sand Bed Dewatering of Alumina Miniplant Tailings.
Rept. of investigations/1982,
R. L. Rickel, P. J. Barrett, and D. M. Starrett. Jul 82, 16p BUMINES-RI-8677

The Bureau of Mines, as part of its minerals environmental technology research, conducted a study of mine waste tailings disposal. Part of the investigation evaluated the sand bed dewatering technique for disposal of alumina miniplant tailings as a means to increase consolidation rates and contain effluents. The technique employs a bed of sand resting on an impervious bottom. The tailings slurry is impounded over the sand layer and is dewatered through bottom drain piping. The study employed a single 10-ft-high, 6-in-diam, clear polyvinyl-chloride (PVC) column, and thickener wastes from the acid leaching of calcined kaolin clay.

PB82-263435 PC **A02**/MF **A01**
Bureau of Mines, Salt Lake City, UT. Salt Lake City Research Center.
Direct Flotation of Potash from Carnallite.
Rept. of investigations/1982,
D. G. Foot, Jr., C. E. Jordan, and J. L. Huiatt. Jul 82, 16p BUMINES-RI-8678

The Bureau of Mines devised a direct flotation method for recovering potash from carnallite (KC1.MgC12.6H2O) ore characterized by a high content of water-insoluble impurities. The method includes (1) a decomposition leach of the carnallite, (2) flocculation-depression of the insoluble slimes, (3) potash rougher, cleaner, and recleaner flotation, and (4) final product leaching. The technique eliminates the necessity for removing the water-insoluble slimes by mechanical or flotation desliming.

PB82-263492 PC **A02**/MF **A01**
Bureau of Mines, Salt Lake City, UT. Salt Lake City Research Center.
Molybdenum Removal from Concentrator Waste Water.
Rept. of investigations/1982,
R. O. Dannenberg, A. E. Petersen, P. B. Altringer, and P. T. Brooks. Jul 82, 21p BUMINES-RI-8686

The Bureau of Mines conducted laboratory batch and small-scale continuous tests to remove traces of dissolved molybdenum from water simulating waste discharged from a molybdenum concentrator. Molybdenum concentrations, initially ranging from 2 to 10 ppm, were decreased to 0.5 ppm or less by coprecipitation of the molybdenum with freshly precipitated ferric hydroxide. The precipitate was separated as a froth by dissolved-air flotation for subsequent disposal. Although the treated water met current environmental standards for contained molybdenum, contained particulate iron might have to be removed by filtration for the water to be acceptable. Estimated costs for treating concentrator effluent water were 55 cents, 57 cents, and 64 cents per 1,000 gal at initial molybdenum concentrations of 2, 4, and 10 ppm, respectively.

PB82-875071 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Strip Mining: Impacts on Water Resources. 1977-September, 1982 (Citations from the Selected Water Resources Abstracts Data Base).
Rept. for 1977-Sep 82.
Sep 82, 94p
Prepared in cooperation with Office of Water Research and Technology, Washington, DC.

This bibliography contains citations concerning strip mine wastes and the effect on water resources. The studies are both general, investigating the hydraulics of wastes and runoff, and specific, reporting on results of surveys at some strip mines. Some citations reference land reclamation techniques and efforts. (Contains 58 citations fully indexed and including a title list.)

8J. Physical Oceanography

AD-A118 589/1 PC **A04**/MF **A01**
Amherst Coll., MA.
Definitive Determinations of the Solubilities of Oxygen and Hydrogen, and Verification of the Applicability of the Setschenow Relationship to Sea Water.
Final technical rept.,
Bruce B. Benson, and Daniel Krause, Jr. 18 Nov 80, 62p
Contract N00014-78-C-0198

This final technical report is composed of two reprints plus the summary of those two papers and a discussion of other work that is now in preparation for publication.

AD-A118 765/7 PC **A03**/MF **A01**
Naval Ocean Research and Development Activity, NSTL Station, MS.
Sound Speed Structure of the Western South Atlantic Ocean.
Final technical note,
Don F. Fenner. Jul 82, 47p Rept no. NORDA-TN-107

The sound speed structure of the western South Atlantic Ocean is far more variable than that found in the North Atlantic or North Indian Oceans, largely due to hemispheric position and a wide variety of surface, near-surface, intermediate depth, and near-bottom water masses. In the South Atlantic, summer is defined as January-March and winter as July-September. The

wide variety of temperature and salinity variability throughout the western South Atlantic leads to entirely differently shaped sound speed profiles and entirely different values of the depth of the deep sound channel axis and critical depth. These differences undoubtedly have significant effects on acoustic propagation. This report examines western South Atlantic sound speed variability along three cross-sections for both summer and winter, relates variability in sound speed structures to surface currents, the Antarctic Intermediate Water, Mediterrannean Intermediate Water, and Antarctic Bottom Water core flows west of the Mid-Atlantic Ridge, and defines the number of observations deeper than the depth of the deep sound channel axis during both summer and winter for the entire South Atlantic Ocean between the Equator and 45 S latitude. (Author)

PB82-261041 PC **A02**/MF **A01**
Nederlands Centrum voor Oceanografische Gegevens, De Bilt.
Sea-Going Measurement Programmes in the Netherlands: 1981 Planned.
Feb 81, 15p

This publication contains a systematic overview of planned sea-going measurement programs by Netherlands institutions and organizations for 1981. Starting with 1980, every 5 years, this publication contains information on measurements of waves and tide along the Dutch coast.

8K. Seismology

AD-A118 503/2 PC **A05**/MF **A01**
Systems, Science and Software, La Jolla, CA.
A Model for Tectonic Strain Release from Explosions in Complex Prestress Fields Applied to Anomalous Seismic Waves from NTS and Eastern Kazakh Explosions.
Technical rept.,
J. L. Stevens. Jan 82, 82p SSS-R-82-5358, VSC-TR-82-20
Contract F08606-79-C-0008, ARPA Order-2551

Anomalous surface waves including Love waves and phase reversed Rayleigh waves have been observed from explosions at NTS and from the eastern Kazakh areas of the Soviet Union. In this report we use a linear model for tectonic strain release to estimate the amount and type of prestress required to produce these anomalies. An important use of these results is to guide the input to fully nonlinear simulations of an explosion detonated in a prestressed environment.

AD-A118 778/0 PC **A05**/MF **A01**
Teledyne Geotech, Alexandria, VA. Seismic Data Analysis Center.
Definition of Seismic Signal Parameters by Particle-Motion Processing.
Technical rept.,
D. H. von Seggern, and M. E. Marshall. 22 Jan 82, 99p SDAC-TR-81-19, VSC-TR-82-10
Contract F08606-79-C-0007, DARPA Order-2551

Theoretical and observed particle motion of P and Lg waves indicates that a successful definition of signal parameters can be made by particle-motion algorithms. Tests on many Pn, Pg, and P phases recorded at OB2NV and RKON reveal that back azimuths can be estimated almost always to within + or - 20 deg at $S/N > 5$ and quite often to this precision at $S/N < 5$. Incidence angles are not sufficiently resolved to reliably discriminate regional from teleseismic P waves though. Lg waves recorded at these same stations yielded better back azimuth estimates at equivalent S/N ratios than P waves. The azimuth estimates made by particle-motion processing showed no deterioration with increasing frequency to 10 Hz, provided S/N remained high. An experiment using 3-component data at ANMO, BOCO, and BCAO resulted in only mild success for characterizing wave type and measuring the signal parameters with particle-motion processing; more complex algorithms and additional kinds of processing will be required to identify regional phases routinely. (Author)

AD-A118 793/9 PC **A03**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Geological Sciences.
High-Frequency Seismic Wave Propagation in Western South America along the Continental Margin, in the Nazca Plate and Across the Altiplano,
Douglas S. Chinn, Bryan L. Isacks, and Muawia Barazangi. 20 Jun 79, 35p Rept no. CONTRIB-629
Contract N00014-75-C-1121
Pub. in Geophysical Jnl. of the Royal Astronomical Society, v60 p209-244 1980.

No abstract available.

8L. Snow, Ice, and Permafrost

PB82-263344 PC **A04**/MF **A01**
National Research Council, Washington, DC.
Polar Research Board Annual Report 1981 and Future Plans.
Rept. for Jan-Dec 81.
1982, 59p

The report describes studies completed, work in progress, and projects planned for initiation in the coming year. International activities related to the Polar Research Board's role as U.S. national committee for the Scientific Committee on Antarctic Research of the International Council of Scientific Unions are also described.

8M. Soil Mechanics

AD-A118 486/0 PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab., Hanover, NH.
Relationship between the Ice and Unfrozen Water Phases in Frozen Soil as Determined by Pulsed Nuclear Magnetic Resonance and Physical Desorption Data,
A. R. Tice, J. L. Oliphant, Y. Nakano, and T. F. Jenkins. Jun 82, 15p Rept no. CRREL-82-15
Errata sheet inserted.

An experiment is described that demonstrates the balance between the ice and the unfrozen water in a frozen soil as water is removed. Nuclear magnetic resonance (NMR) is used to monitor the unfrozen water content as the soil is dehydrated by a molecular sieve material. Our results show that the unfrozen water content of a Morin clay soil remains constant until the total water content has been reduced to the point where no ice remains in the system. Once the ice is depleted, the unfrozen water content determined by NMR corresponds to the total water content of the soil determined by the weight of water removed by the molecular sieve material. Thus the validity of utilizing NMR in determining unfrozen water contents vs temperature is established. (Author)

AD-A118 487/8 PC **A06**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS.
User's Guide: Computer Program for Bearing Capacity Analyses of Shallow Foundations (CBEAR).
Final rept.,
Reed L. Mosher, and Michael E. Pace. Jun 82, 113p
Rept no. WES-INSTRUCTION-K-82-7

This user's guide documents a computer program called CBEAR that can be used for analysis of the bearing capacity of shallow strip, rectangular, square, or circular foundations on one- or two-layer soil systems.

DE82008641 PC **A06**/MF **A01**
EarthTech Research Corp., Baltimore, MD.
Thermal Properties of Soils and Soils Testing.
17 Feb 81, 106p DOE/SF/11509-T1
Contract AC03-80SF11509

The thermal properties of soils are reviewed with reference to the use of soils as heat sources, heat sinks, or thermal storage. Specific heat and thermal conductivity are discussed. (ERA citation 07:048289)

PB82-260530 PC **A07**/MF **A01**
Laboratorium voor Grondmechanica, Delft (Netherlands).
IGM Mededelingen. Part XXI No. 1 April 1980: Nonlinearty in Groundwater Flow,
F. B. J. Barends. Apr 80, 126p

The subject of this thesis is the nonlinear aspects of groundwater flow. The theory of seepage must be based on the system water-soil-air. However, the physical properties of this system are usually restricted to saturated and/or undeformable porous media. In this thesis an attempt is made to extend the contemporary theory to compressible pore fluid flow in a semi-saturated deformable porous medium. The contents of chapter 2 consist of an exposition of the fundamental laws describing the constitution of the substances involved as well as their interaction. Chapter 3 is devoted to a general mathematical formulation of the equations of motion for pore fluid flow. A typical feature of groundwater flow is the existence of a free (phreatic) surface, which may change with pore pressure fluctuations. The flow field geometry varies and this phenomenon is discussed in chapter 5. In conclusion, chapter 6 elucidates once again the main lines of discussion in this thesis emphasizing the principles results.

PB82-260555 PC **A03**/MF **A01**
Laboratorium voor Grondmechanica, Delft (Netherlands).
IGM Mededelingen. Part XXI No. 3 August 1980: Delta-Flume,
J. Lindenberg, and C. J. Kenter. Aug 80, 47p

In the first part of the report combined hydraulics and soil mechanics research is described. An attempt is made to explain the differences in working methods between both specialisms and the value of scale models in soil mechanics is illustrated. A transition zone in which both laboratories are active is defined. The other fields for combined research are mentioned as well as a number of combined hydraulics and soil mechanics problems. One subject, the phenomenon of flow slides in loosely packed sand, is dealt with more profoundly.

PB82-260563 PC **A05**/MF **A01**
Laboratorium voor Grondmechanica, Delft (Netherlands).
IGM Mededelingen. Part XXI No. 2 June 1980: Tribute to Professor De Josselin de Jong,
Jun 80, 94p

The deformation of soils plays an essential role in the foundation of constructions. Disregarding this aspect may lead to ineconomic or malfunctioning designs. In searching more advanced approaches one should be aware that the actual loading varies and the duration of extreme situations as well as its frequency must be taken into consideration. The variety of soil types and the complexity of its behavior in combination with an overlying structure make a realistic analysis almost inachievable. It is sometimes possible to refine the conventional approach. The report deals with a practical way to take into account the dynamic behavior of plates on a flexible subsoil, such as dyke protection and road construction.

PB82-260936 PC **A02**/MF **A01**
Pacific Northwest Forest and Range Experiment Station, Portland, OR.
Total Soil Nitrogen Analysis Using Micro-Kjeldahl Digestion and Portable Distillation Equipment.
Forest Service research note,
J. Michael Geist. Mar 73, 10p FSRN-PNW-198

Equipment modifications and methodology alternatives for determining total nitrogen in soils using a micro-Kjeldahl digestion apparatus were investigated. Results showed that using an air shield over the flask bulbs and a standard copper catalyst-salt mixture should give satisfactory recovery in routine analyses with a running time and sample size similar to that used with macro-Kjeldahl racks. Recovery of several standards was high (96-99 percent), but for recovery of highly refractory compounds, methodology adjustments will be required.

PB82-263229 PC **A13**/MF **A01**
Maryland Univ., College Park. Dept. of Civil Engineering.
Field Shear Strength of Dredged Material in the Chesapeake Bay Area of Maryland,
Final rept.,
M. S. Aggour, and M. I. M. Amer. Dec 80, 282p
PPSP/PPRP-74

This report presents the results of field vane shear strength tests which were performed at seventeen boring locations in four confined disposal sites around the Chesapeake Bay area in the State of Maryland. Undisturbed tube samples were taken from the same locations for laboratory analysis. The field shear strength tests were conducted using a Nilcon Vane Borer at all locations. An Acker vane apparatus and a Pilcon laboratory vane device were also used at one of the sites for the purpose of correlation with the Nilcon apparatus. The shear strength results were lowest at mid-depth of the dredged material. The results were highest near the surface. The shear strength was found to increase with the increase in distance from the overflow weir at any given site.

PB82-263468 PC **A10**/MF **A01**
Maryland Univ., College Park. Dept. of Civil Engineering.
Characteristics of Dredged Material in the Chesapeake Bay of Maryland.
Final rept.,
M. S. Aggour, and Chien-Cheng Hu. Aug 79, 211p PPSP/PPRP-73

This report was directed towards the determination of the characteristics of dredged materials deposited in five different confined disposal sites in the Chesapeake Bay area of the state of Maryland to ascertain the feasibility of mechanically filling disposal basins with dredged materials from power plant construction. Data was acquired through a program of sampling and testing of dredged materials. A piston sampler was developed for the sampling program, standard tests of American Society of Testing and Materials were used to determine the characteristics, and the Unified Soil Classification System was used to classify the dredged materials. Test results showed that the water contents in the deep fine-grained areas were fairly high with a value ranging from 60 to 125 percent, and the dry densities were relatively low with a range from 30 to 70, lbs/cu ft.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A118 475/3 PC **A08**/MF **A01**
Varian Associates, Inc., Beverly, MA. Beverly Div.
Construction, Test and Delivery of Standardized Coaxial Magnetron.
Final rept. 16 Jul 79-17 Apr 81,
T. E. Ruden. 23 Sep 81, 162p NOSC-CR-112
Contracts N66001-79-C-0225, N00039-79-C-0150

A VMS-1104 coaxial magnetron was constructed and evaluated. The SPN-43 radar transmitter cabinet was modified to accept this tube; satisfactory operation of the tube and modification kit in an SPN-43 system was demonstrated at a Navy test facility. An additional VMS-1104 tube and spare vacuum insert was constructed, tested and delivered. Spurious signal from these tubes is -50 dB or better. A VMS-1054 coaxial magnetron was constructed and evaluated. Satisfactory rf performance was demonstrated. Spurious signal generation from this tube closely approximated -60 dB. (Author)

AD-A118 629/5 Not available NTIS
Colorado State Univ., Fort Collins. Dept. of Electrical Engineering.
Electron-Beam Induced Current in GaAs Field-Effect Transistors,
D. S. Newman, and D. K. Ferry. 23 Feb 82, 4p ARO-17818.4-EL
Contract DAAG29-81-K-0051
Availability: Pub. in Applied Physics Letters, v41 n2 p169-171, 15 Jul 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 662/6 PC **A02**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
Electron Spectroscopy Analysis of Contact Surfaces in the Wear of Carbon Brushes against Copper Commutators,
D. E. Savage, M. G. Lagally, and M. E. Schrader. 11 Nov 80, 21p Rept no. DTNSRDC-82/064
Pub. in Applications of Surface Science, v7 p142-155 1981.

No abstract available.

AD-A118 764/0 PC **A04**/MF **A01**
Frequency Electronics, Inc., New Hyde Park, NY.
High Performance Crystal Oscillator Development.
Interim rept. 1 Oct 80-30 Apr 82,
John Ho. Jul 82, 56p RADC-TR-82-191
Contract F19628-80-C-0198

This contract calls for design, development, fabrication, and test of a fast warm-up Crystal Oscillator operating at 5 MHz and 10.05+ MHz. This first status report indicates that from the test results of the oscillators developed so far, further reductions of inner oven and oscillator assembly MASS is required. In addition, an approved method of coupling heat into the crystal blank will be worked upon. In order to reduce mass, redesign of the electronic circuitry from discrete circuits to IC and Hybrid circuits is necessary. A new configuration is shown in the report. The key innovation of the design is to put the heater and temperature sensing devices on a ceramic disk of approximately 1-in. in diameter. A new hybrid approach will permit the fastest warm-up ovenized oscillator of its kind and will out-perform the present model in reliability and quality. (Author)

DE82016029 PC **A02**/MF **A01**
Bendix Corp., Kansas City, MO.
Semirigid Coaxial RF Cable Bending Techniques. Final Report.
W. S. McCleave. May 82, 17p BDX-613-2650
Contract AC04-76DP00613

This project was designed to establish bending characteristics of semirigid coaxial rf cables. The required cable configuration sometimes has large radial bends. To compensate for spring-back cables must be overbent such that the relaxed cable yields the correct shape. Aluminum discs were used as bending mandrels. The cables were bent to various radii and arc lengths. Their spring-back was measured and the values were graphed. The graphs are used as a guideline in cable bending tool design.

DE82701717 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
Electroresistances of Different Components of Superconducting Cables.
V. M. Drobin, E. I. D'yachkov, V. G. Luppov, R. Khertsog, and F. Khovanets. 1980, 5p JINR-R-8-80-594
In Russian.
U.S. Sales Only.

Electroresistances of different components (Nb-Ti alloy, copper matrix, solders and German silver different in composition) being parts of a composite superconducting cable have been measured. Measurements were conducted at room temperature and in the temperature range from 4.2 to 20 K in magnetic fields up to 7 T. During all the measurements magnetic field was directed perpendicular to specimen current. PSrO-5-95 solder, which increases resistance in 7T field more than three times, has the highest sensitivity to the magnetic field. It is shown that for decreasing cooperative dynamic losses in a soldered cable it is necessary to choose either IN2 + KADO-33 solder or PSrO-5-95 as they have the greatest residual specific resistance in a working region, i.e., at $T < 6$ K. If for the given device a high structural density of current is not required, losses can be considerably reduced by means of cable shaping using unsoldered wire joints. (Atomindex citation 13:665424)

PAT-APPL-6-326 303 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Small Diameter, Low Frequency Multimode Hydrophone.
Patent Application,
George C. Connolly. Filed 30 Nov 81, 12p AD-D009 650/3
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Document describes a multimode hydrophone of small diameter and low weight providing dipole directivity patterns over a decade range of low frequencies by utilizing a pair of orthogonal dipole signals and a non-directional reference signal to eliminate directional ambiguity. Each multimode hydrophone is a thin wall tube divided electrically into quadrants which permits differencing of opposing halves to produce signals with dipole directivity patterns and the formation of a non-directional reference signal by summing all four quadrants. The hydrophone tube comprises inert and piezoelectric materials, selected and combined so as to shift the resonant frequency of the tube lower while keeping the overall tube diameter as small as possible. (Author)

PAT-APPL-6-344 098 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Broad Bandwidth Composite Transducers.
Patent Application,
K. Klicker, R. E. Newnham, L. E. Cross, and L. J. Bowen. Filed 29 Jan 82, 12p AD-D009 640/4
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A broad bandwidth electro-mechanical transducer is described wherein the transducer is shaped into a wedge of varying thickness wherein a plurality of PZT elements or sheets are embedded in an inactive polymer. The transducer is driven at frequencies corresponding to resonance of the thickness dimensions. The piezoelectric elements with different thicknesses are decoupled mechanically from one another using an inactive polymer of low Q so as to prevent interference. (Author)

PAT-APPL-6-344 417 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Low Loss Buoyant Coaxial Cable.
Patent Application,
Kurt F. Hafner. Filed 1 Feb 82, 10p AD-D009 647/9
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A low loss buoyant coaxial cable has its buoyant material placed between its conductors to allow for maximum cable cross section for electrical transmission. In addition, the strength members are placed radially inward of the center conductor to reduce wearing of the strength members and keeping the electrical performance independent of the electrical properties of the strength members. An alternate embodiment has buoyant material centrally located and the strength members placed with buoyant material between the coaxial conductors. (Author)

PAT-APPL-6-375 640 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Multiconductor Flat Cable and Method and Apparatus for Assembling Same.
Patent Application,
Edward A. Escallier. Filed 6 May 82, 19p AD-D009 632/1
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A multiconductor flat cable incorporates an approximately right angle turn in its conductor runs. The right angle turn is provided by first securing the conductor runs in a desired spacing through a first lamination of insulation cover and base sheets while leaving portions of the conductor runs exposed through a window in the first lamination. The first lamination is then severed at the lateral edges of the window so that an end portion of the first lamination may be moved ninety degrees relative to a remaining body portion thereto. The right angle turn is then secured by forming a second

lamination with cover and base layers so as to overlap the first lamination and the turn in the conductor runs. (Author)

PAT-APPL-6-384 291 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
InP:Te Protective Layer for Reducing Substrate Dissociation.
Patent Application,
Frank Z. Hawrylo. Filed 25 Jun 82, 10p AD-D009 636/2
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

In order to prevent the formation of indium droplets upon the surface of an indium phosphide wafer during liquid phase epitaxial growth, a doped protective layer is deposited by LPE upon said substrate before epitaxial growth of additional layers occurs. The doped protective layer is composed of indium phosphide doped with tellerium to a concentration of about high 10 to the 18th power to low 10 to the 19th power.

PAT-APPL-6-394 753 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Supported Dielectric Waveguide Transmission Line and Components.
Patent Application,
Richard A. Stern, and Richard W. Babbitt. Filed 2 Jul 82, 11p AD-D009 657/8
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A dielectric waveguide or other dielectric millimeter wavelength circuit element is bonded to and supported by a dielectric member. In addition to providing a rigid support the support member may also be used as a heat sink. (Author)

PATENT-4 330 768 Not available NTIS
Department of the Navy, Washington, DC.
Dispersion Compensated Acoustic Surface Waveguides Using Diffused Substrates.
Patent,
Peter H. C. Huang, Joseph F. Weller, and Thomas G. Giallorenzi. Filed 2 Oct 80, patented 18 May 82, 7p AD-D009 660/2, PAT-APPL-6-192 962
Supersedes PAT-APPL-6-192 962, AD-D007 780.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A surface acoustical wave (SAW) waveguide device which compensates for dispersion by utilizing diffused substrates. Various embodiments have in-diffused or out-diffused core regions in which the ray is channeled that are topped by a thin metallic film overlay. Partially surrounding each core region are cladding portions which are also selectively in-diffused or out-diffused and may be covered by the metal overlay. By varying the amounts of in-diffusion or out-diffusion for the particular application, the effects of dispersion are minimized. (Author)

PATENT-4 331 374 Not available NTIS
Department of the Navy, Washington, DC.
Coaxial Termination for Cable In-Line Electronic Applications.
Patent,
Raymond J. Phillips. Filed 24 Jul 80, patented 25 May 82, 4p AD-D009 628/9, PAT-APPL-6-171 860
Supersedes PAT-APPL-6-171 860, AD-D007 788.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A cable terminator assembly for a coaxial cable includes a housing having a braided extension affixed thereto for transferring tensile strength from a cable to the housing and braided extension. An inner cylindrical piece is swaged to the housing for holding the braided extension in place. A dielectric clamp with a closure ring, flat locking washer and cap complete the components within the termination. The washer is keyed to the housing and, together with the housing, clamp the stranded cable conductor. The keying prevents turning of the mating components so that the stranded cable conductor will not be damaged. The clamping of the strands makes electrical contract between the strands and the assembly. The dielectric clamp is forced to bite into the dielectric material of the coaxial cable. This provides a firm mechanical hold. (Author)

PB82-261173 PC **A05**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 27, Number 2, 1977.
1977, 84p
Text in Japanese and English, abstract in English.

Document contains articles on the following subjects: IMPACT Fracture of Implosion-protected Color Television Bulb (Text in Japanese); Water Permeability of Glass Fiber Reinforced Cement Composites (Text in Japanese); A new Synthetic Method of Perfluoroalkyl Carboxylic Acid (Text in English); The Mesomorphic and Thermodynamic Properties of trans-4-Substituted-Alpha (or Beta)-Methylcinnamic Acids (Text in English); An Experimental Study of Turbulence Promotors in Electrodialysis (Text in English); and Characteristics of SF6 Gas from the Hygienic Point of View.

PB82-263377 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC.
Electric and Magnetic Field Measurements: 1981 Annual Report.
R. H. McKnight, F. R. Kotter, M. Misakian, and J. N. Hagler. Jul 82, 50p NBSIR-82-2527
See also PB81-218182. Sponsored in part by Department of Energy, Washington, DC.

The NBS program is concerned with developing methods for evaluating and calibrating instrumentation for use in measuring the electric field and various ion-related electrical quantities in the vicinity of high voltage direct current (HVDC) transmission lines and in apparatus designed to simulate the transmission line environment.

PB82-875543 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Ultrasonic Transducers. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 213p
Supersedes PB82-854365.

This bibliography contains citations concerning ultrasonic transducer technology. Design, development, fabrication, and applications of ultrasonic transducers are included. Among the applications presented are the inspection of solid objects using piezoelectric ultrasonic transducers, light modulation, materials testing and characterization. (This updated bibliography contains 188 citations, 44 of which are new entries to the previous edition.)

PB82-875683 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrical Cables. June, 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 262p
Supersedes PB80-857329.

This bibliography contains citations concerning applications and development of electrical coaxial and conduit cables used in communications and power transmission. The fabrication of various cables with different insulating materials for low-loss, superconducting, and underground and earthquake resistant applications are discussed. (This updated bibliography contains 224 citations, 60 of which are new entries to the previous edition.)

PB82-876020 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nondestructive Testing for Microelectronics, Semiconductors, and Superconductors. 1972-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 100p
Supersedes PB81-853301.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliogrpahy contains citations concerning the theory and vairous techniques for nondestructive testing or examination of microelectornic devices, semiconductor devices, and superconductors for the detection of flaws or defects which affect their properties and behavior. Some attention is also given to uniformity and quality control in integrated circuit manufacturing. (This updated bibliography contains 93 citations, 17 of which are new entries to the previous edition.)

PB82-876038 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nondestructive Testing for Microelectronics, Semiconductors, and Superconductors. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 193p
Supersedes PB81-853293.

This bibliography contains citations concerning the theory and various techniques for nondestructive testing or examination of microelectronic devices, semiconductor devices, and superconductors for the detection of flaws or defects which affect their properties and behavior. Some attention is also given to uniformity and quality control in integrated circuit manufacturing. (This updated bibliography contains 154 citations, 34 of which are new entries to the previous edition.)

9B. Computers

AD-A118 479/5 PC **A11**/MF **A01**
Boeing Aerospace Co., Houston, TX.
Sneak Analysis Application Guidelines.
Final technical rept. 3 Feb 81-12 Mar 82,
Davey L. Buratti, and Sylvia G. Godoy. Jun 82, 234p RADC-TR-82-179
Contract F30602-81-C-0053

Sneak analysis is an engineering tool which can used to identify designed-in conditions that can inhibit desired system functions resulting in lower operational reliability. The objective of this study was to develop guidelines for applying sneak analysis to hardware and software contracts in a cost effective manner. Specific guidelines for establishment of sneak analysis requirements, monitoring of sneak analysis efforts, determining program costs, evaluation criteria and determining candidate equipments have been defined. Criteria for tailoring the guidelines to the program needs have also been established. A measure of sneak analysis effectiveness was determined which shows excellent results in early program development phases including improved system reliability. (Author)

AD-A118 570/1 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Electrical Engineering and Computer Science.
Algorithms for Program Verification.
Final rept. 1 Jul 80-30 Jun 81,
Vaughan R. Pratt. May 82, 8p AFOSR-TR-82-0645
Grant AFOSR-80-0225

In the previous reporting period, July 1979 to June 1980, work was performed on (1) foundations for specifying automatic program verifiers (Pr1,Pr3), (2) decision methods for a large fragment of the basic logic of programs (Pr5), (3) implementation of a decision method for propositional dynamic logic, and (4) continued maintenance of MITVI (LP), a program verifier incorporating some of these ideas. In the current (and final) reporting period, the research emphasis shifted from the verification of sequential programs to that of dataflow programs. This week has led to new insights into the correspondence between functions and processes (Pr4,Pr7). It has also stimulated work on a new approach to user environments (Pr6). And it has raised, though not answered, problems concerning automated verification of dataflow programs. (Author)

AD-A118 577/6 PC **A02**/MF **A01**
Texas Univ. at Austin. Dept. of Computer Sciences.
Final Report on Grant AFOSR-81-0080.
Final rept. 1 Mar 81-28 Feb 82,
Larry S. Davis. Apr 82, 6p AFOSR-TR-82-0663
Grant AFOSR-81-0080

This report summarizes progress made under support of the grant; developing an image segmentation algorithm called MITES; and recovering the three-dimen-

sional orientation of a planar textured surface from an image of that surface. (Author)

AD-A118 731/9 PC **A13**/MF **A01**
PAR Technology Corp., New Hartford, NY.
On-Line Pattern Analysis and Recognition System. OLPARS VI. Programmer and System Maintenance Manual,
Steven E. Haehn, and Donna Morris. 18 Jun 82, 278p Rept no. PAR-82-15
See also AD-A118 732.

The OLPARS Programmer and System Maintenance Manual (or Programmer's Reference Manual) contains the detailed information about the structure of all the files used in 'portable' OLPARS. The manual also describes how to access the information contained in these files. A separate section describes the different 'displays' OLPARS Generates, along with detailed information about the contents of the user's 'display' files. Terminal and text-file input and output packages are described in detail here, also. (Author)

AD-A118 732/7 PC **A99**/MF **A01**
PAR Technology Corp., New Hartford, NY.
On-Line Pattern Analysis and Recognition System. OLPARS VI. Software Reference Manual,
Steven E. Haehn, and Donna Morris. 18 Jun 82, 930p Rept no. PAR-82-20
See also AD-A118 733.

There are 2 manuals referred to under this title: A Programmers Reference and Maintenance Manual (PRM), and a Software Reference Manual (SRM). The PRM gives a detailed view on OLPARS and data structures and concepts. The SRM gives detailed information on all the OLPARS commands and their subprograms (e.g., calling sequences, function). (Author)

AD-A118 733/5 PC **A17**/MF **A01**
PAR Technology Corp., New Hartford, NY.
On-Line Pattern Analysis and Recognition System. OLPARS VI. User's Manual,
Steven E. Haehn, and Donna Morris. 18 Jun 82, 380p Rept no. PAR-82-21
See also AD-A118 731.

The User's Manual introduces the reader to OLPARS concepts, some pattern recognition methodology, and the OLPARS displays. Instructions example usage of each OLPARS command is included. (Author)

AD-A118 811/9 MF **A01**
Marine Corps Tactical Systems Support Activity, Camp Pendleton, CA.
Digital Communications Terminal High Order Programming Language Study (DCT HOL Study). Volume II. Appendices.
Final rept.,
K. C. Shumate, R. E. Sauer, G. E. Anderson, J. W. Hooper, and B. F. Brady. 26 Nov 80, 101p Rept no. 24E005/U-TN-01-VOL-2
See also Volume 1, AD-A118 780.
Availability: Microfiche copies only.

This paper reports the results of a study to select a high order programming language for the development of computer programs for the digital communications terminal. All languages suitable for use with the NSC800 microprocessor were considered. The nine final candidates were evaluated by a methodology including benchmarking and determination of a figure of merit. During the conduct of the study it became clear that the program support environment must include both a minicomputer software engineering host, and a microcomputer development system. The language selected is Interactive Systems C. The system includes a cross-compiler running on a PDP-11 and generating code for the NSC800. (Author)

AD-A118 813/5 PC **A07**/MF **A01**
Rhode Island Univ., Kingston. Dept. of Computer Science and Statistics.
Algorithmic Complexity. Volume I.
Final techncial rept. Jun 79-Aug 81,
Edmund A. Lamagna, Leonard J. Bass, Lyle A. Anderson, Ralph E. Bunker, and Philip J. Janus. Jun 82, 129p 81-161-VOL-1, RADC-TR-82-152-VOL-1
Contract F30602-79-C-0124
See also Volume 2, AD-A118 814.

The objective of this study was to conduct applied research directed toward understanding the relationship between the complexity or efficiency of algorithms and the overall quality of computer software. The final report is presented in a two volume series consisting of a total of eight parts. This volume, containing Parts 1 and 2, comprises a general introduction to the entire series and a research plan. Part 1 begins with a description of the goals of the overall contract effort. This is followed by a discussion of previous RADC work on software quality metrics, emphasizing measures concerned with the time and storage efficiency of programs. Next, an overview of the field of algorithm analysis and computational complexity is given. A final section contains an introduction to the particular research investigations pursued in the other portions of this study. Part 2 presents a research plan for advancing the state-of-the-art in the area of algorithm performance. An Appendix contains an outline of the major topics and issues addressed in the area of algorithm analysis and computational complexity, together with an annotated select bibliography.

AD-A118 814/3 PC **A16**/MF **A01**
Rhode Island Univ., Kingston. Dept. of Computer Science and Statistics.
Algorithmic Complexity. Volume II.
Final technical rept. Jun 79-Aug 81,
Edmund A. Lamagna, Leonard J. Bass, Lyle A. Anderson, Ralph E. Bunker, and Philip J. Janus. Jun 82, 353p 81-161-VOL-2, RADC-TR-82-152-VOL-2
Contract F30602-79-C-0124
See also Volume 1, AD-A118 813.

The objective of this study was to conduct applied research directed toward understanding the relationship between the complexity or efficiency of algorithms and the overall quality of computer software. The final report is presented in a two volume series consisting of a total of eight parts. This volume, containing parts 3 through 8 describes the results of several technical investigations which are conducted. Part 3 is a tutorial on computational algebra, illustrating the nature of research in the area of algorithm analysis and computational complexity. Part 4 develops a systematic approach to the analysis of algorithms. Part 5 is an experimental analysis of a fast, new sorting method called DPS (distributive partitioning sorting). Part 6 applies order statistics to investigate the expected quality of several approximation algorithms for the Euclidean traveling salesman problem, known to be NP-complete. Part 7 presents a survey of data base access methods for both univariate and multivariate range queries. Part 8 describes an experimental evaluation of the frame memory model of a data base structure.

AD-A118 822/6 PC **A09**/MF **A01**
Assessment Systems Corp., St. Paul, MN.
Development of a Microcomputer-Based Adaptive Testing System. Phase I. Specification of Requirements and Preliminary Design.
Final rept. 1 Jan-30 Jun 82,
C. David Vale, Carl Albing, Lisa Foote-Lennox, and Thom Foote-Lennox. 30 Jun 82, 176p Rept no. ONR-ASC-82-01
Contract N00014-82-C-0132

Specifications were developed for a microcomputer-based adapative testing system based on reviews of item types in current use and a survey of the needs and desires of individuals engaged in adaptive testing research and other related activities. From these specifications, a general system configuration was developed and the design of a general-purpose software package was initiated. This design included subsystems for test construction, item banking, test administration, test reporting, and test analysis. Various microcomputer systems were considered in search of hardware on which to implement the design; of these, three eight-bit microcomputer systems were selected for future consideration. A draft of a user's manual, reviewed by experts, was developed for the proposed system and served as a preliminary design document. In summary, this research indicated that a definite need exists for a microcomputer-based adaptive testing system and that the proposed system would meet that need. (Author)

AD-A118 825/9 PC **A04**/MF **A01**
SofTech, Inc., Dayton, OH.
JOVIAL J73 Programming Support Library.
Final technical rept. Jul 80-Jan 82,
Andrew J. Cruscicki, Louis Simpson, and R. Sheffield. Jun 82, 60p RADC-TR-82-162
Contract F30602-80-C-0244

The JOVIAL J73 Programming Support Library (J73 PSL), an environment for the orderly creation of J73 Software Systems, is presented. This technical report has been developed as a self-contained/stand-alone document. That is, the TR first presents a thorough contract overview followed by a discussion of the technological concepts (i.e., Top-down programming and segmentation) incorporated as features of the J73PSL. A brief command verb summary then proceeds a section devoted to the relationship between the J73PSL and configuration control and management. The remainder of the TR is devoted to certain project tasks followed by a discussion of perceived future directions for this technology. (Author)

AD-A118 826/7 PC **A11**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
Microprocessor Self-Test: Software Self-Test for an 8080-Based System Using a Minimum of Additional Hardware.
Final technical rept. 1 Sep 80-31 Aug 81,
James R. Armstrong, and F. Gail Gray. Jun 82, 242p RADC-TR-82-80
Contract F30602-80-C-0200

A self-test program for an 8080-based microprocessor system is developed and verified using both high-level simulation and actual hardware components. The goals were minimum execution time, minimum added hardware, and minimum impact on applications software. Within these constraints, maximum fault coverage was obtained. A high-level simulation language (GSP) was used to verify the execution of the self-test program and to determine the fault coverage. The self-test programs provided excellent diagnostic routines to test the simulation models and indeed were used to discover several faulty simulation models. Finally, a complete self-testing hardware system was constructed to verify that the self-test program would run in the background of an applications program. (Author)

AD-A118 840/8 PC **A05**/MF **A01**
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
Equivalence Testing for FORTRAN Mutation System Using Data Flow Analysis.
Interim technical rept.,
Akihiko Tanaka. Dec 81, 76p Rept no. GIT-ICS-82/10
Contracts N00014-79-C-0231, DAAG29-80-C-0120

Program mutation is a new approach to program testing, a method designed to test whether a program is either correct or radically incorrect. It requires the creation of a nearly correct program called a mutant from a program P. An adequate set of test data distinguishes all mutants from P by comparing the outputs. Obviously, an equivalent mutant, which performs identically to P, produces the same outputs as those of P. Thus, for adequate data selection, it is desirable that an equivalent mutant be excluded from the testing process. For this purpose, the system equivalence command has been implemented as an equivalent mutant detector. As yet, the command has not been automated. Automatic detection by this command is implemented here as an application of data flow analysis. Algorithms and implementation techniques of data flow analysis are described. Also its application as an automatic detector is described. (Author)

AD-A118 843/2 PC **A04**/MF **A01**
Naval Research Lab., Washington, DC.
A Formal Foundation for the Trace Method of Software Specification.
Interim rept.,
J. McLean. 1 Sep 82, 63p Rept no. NRL-MR-4874

An overview of the trace method for the abstract specification of software is followed by a syntax, semantics, and derivation system for the method. This foundation supports a comparison of the trace method with the algebraic approaches to abstract specification, while completeness and soundness theorems suggest methods for proving specifications consistent and sufficiently-complete. Areas for future research are discussed. (Author)

DE82001812 MF **A01**
Brookhaven National Lab., Upton, NY.
Toward a Silicon Compiler.
A. M. Peskin. Sep 81, 16p BNL-30153, CONF-820602-1

Contract AC02-76CH00016
19. design automation conference, Las Vegas, NV, USA, 14 Jun 1982.
Available in microfiche only.

The term silicon compiler is used to denote a program with the translational attributes of a compiler, yet whose object is a hardware device rather than software. It is, in a sense, the ultimate CAD tool. A comprehensive digital system design environment has been created which is particularly well suited to low production, high technology applications. This environment, called the SPEK system, includes simulation, testability analysis, layout and cross-checking tools. It also contains prototypical hardware synthesis algorithms.

DE82006301 MF **A01**
Sandia National Labs., Albuquerque, NM.
Interactive Logic Simulation.
J. M. Acken. 1982, 28p SAND-81-2537C, CONF-820602-2
Contract AC04-76DP00789
19. design automation conference, Las Vegas, NV, USA, 14 Jun 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Interactive computing techniques allow maximum utilization of the interface between users and machines. Interactive procedures for generating input and inspecting results for Logic simulation must be supplemented by access to the analysis portion during simulation to allow truly interactive Logic simulation. The Sandia logic Simulator (SALOGS) has implemented interactive simulation.

DE82008174 MF **A01**
Los Alamos National Lab., NM.
Parallel Processing a Large Scientific Problem.
R. Hiromoto. 1982, 17p LA-UR-82-456, CONF-820606-2
Contract W-7405-ENG-36
National computer conference, Houston, TX, USA, 7 Jun 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A parallel-processing experiment is discussed that uses a particle-in-cell (PIC) code to study the feasibility of doing large-scale scientific calculations on multiple-processor architectures. A multithread version of this Los Alamos PIC code was successfully implemented and timed on a UNIVAC System 1100/80 computer. Use of a single copy of the instruction stream, and common memory to hold data, eliminated data transmission between processors. The multiple-processing algorithm exploits the PIC code's high degree of large, independent tasks, as well as the configuration of the UNIVAC System 1100/80. Timing results for the multithread version of the PIC code using one, two, three, and four identical processors are given and are shown to have promising speedup times when compared to the overall run times measured for a single-thread version of the PIC code.

DE82011010 MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Paper and Glass: Graphic-Design Issues for Software Documentation.
A. Marcus. Jan 82, 7p LBL-13967, CONF-820322-1
Contract W-7405-ENG-48
Federal information processing standards software documentation workshop, Washington, DC, USA, 3 Mar 1982, Portions of document are illegible.
Available in microfiche only.

Graphic design principles have been utilized in redesigning the interface for an information management system and for prototypes of typographicly enhanced textual programs. These principles are explained and examples of typical formats are shown to indicate the nature of improvements.

DE82011070 PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Multiprocessor Sort-Merge Join Algorithm for Relational Databases.
W. C. Thompson, III, and D. R. Ries. Dec 81, 27p UCRL-85674-Rev.1, CONF-820616-1
Contract W-7405-ENG-48
ACM/SIGMOD international conference on management of data, Orlando, FL, USA, 2 Jun 1982.

Using multiprocessor systems for rapid processing of relational operations in relational databases is currently a topic of some interest. This paper presents a new multiprocessor algorithm for merge joins of relations. Considerable gains in speed in comparison with existing algorithms are exhibited by this algorithm.

DE82014571 PC **A05**/MF **A01**
Oak Ridge National Lab., TN.
Storage-Efficient Method for Construction of a Thiessen Triangulation.
R. J. Renka. May 82, 92p ORNL/CSD-101
Contract W-7405-ENG-26
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This report establishes a firm theoretical foundation for triangulation algorithms and describes a storage-efficient method and associated software for constructing and representing a triangulation of arbitrarily distributed points in the plane. (ERA citation 07:045448)

DE82014596 PC **A02**/MF **A01**
KMS Fusion, Inc., Ann Arbor, MI.
CCL: Console Command Language, RSX11M V4.0, V7.0C Tutorial.
J. G. Downward. 1981, 15p KMSF-U-1148, CONF-811214-8
Contract AC08-78DP40030
1981 fall DECUS symposium, Los Angeles, CA, USA, 7 Dec 1981.

The normal user interface to an RSX11M operating system is via MCR (Monitor Console Routine). If terminal input is not specifically requested by a task, all data or commands typed in at a user's terminal, are sent by the terminal driver to MCR for decoding. The MCR task (and its child ...SYS) decode user commands (ACT, ABORT,RUN, DEV, ETC.). Tasks installed with special names of the form ...XYZ are treated as an external MCR command. Hence if a user types, XYZ COMMANDLINE, the commandline in its entirety (or at least up to 79 characters) is sent as input to the task ...XYZ. This is the conventional way of supplying most system commands and controlling the operation of the RSX11M utility program. The limitations of this method are: (1) each task must be installed to get MCR command lines; (2) each installed task uses valuable POOL space; (3) only privileged users can INSTALL and REMOVE tasks; and (4) non-privileged users are restricted to RUNning non-installed tasks. To solve this problem, a user tailorable Console Command Language (CCL) has been implemented which allows each user to have a private task control language to pass command lines to tasks that are not installed in th system as external MCR commands. (ERA citation 07:045433)

DE82750289 MF **A01**
Hahn-Meitner-Inst. fuer Kernforschung Berlin G.m.b.H. (Germany, F.R.). Bereich Datenverarbeitung und Elektronik.
Scientific Progress Report 1980.
1981, 215p HMI-348
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The R + D-projects in this field and the infrastructural tasks mentioned are handled in seven working- and two project groups: Computer systems, Numerical and applied mathematics, Software development, Process calculation systems- hardware, Nuclear electronics, measuring- and automatic control technique, Research of component parts and irradiation tests, Central data processing, Processing of process data in the science of medicine, Co-operation in the BERNET-project in the 'Wissenschaftliches Rechenzentrum Berlin (WRB)' (scientific computer center in Berlin). (ERA citation 07:045419)

DE82903563 MF **A01**
Physikalisch-Technische Bundesanstalt, Brunswick (Germany, F.R.). Forschungs- und Messreaktor.
Program Package DATEI for COMMODORE Computers Cbm 3016/3032 for Processing the Floppy-Disk-Data.
H. Lindemann. Aug 80, 59p PTB-FMRB-78
In German.Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A program package is described consisting of three single word-processing programs especially developed for COMMODORE computers of the 3001 series. These three programs are: editor; lister; and blockeditor. Editor is used to create and to update source data files on the floppy disk cbm 3040. Editor, through the use of initialization parameters, will enable the creation of files in a variety of formats: test files, assembler or other program source code files, or many user designed data files. Lister will list any floppy disk standard format text file (i.e. SEQ files) on the screen of the cbm computer or a local printer. Blockeditor provides for floppy disk text file manipulation. The program copies lines of text from any sequential text or data file to create a new sequential text or data file. (ERA citation 07:048936)

N82-29905/8 PC **A02**/MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
Chip Level Simulation of Fault Tolerant Computers.
Status Report, 1 Jun. 1981 - 31 May 1982.
J. R. Armstrong. 31 May 82, 14p NASA-CR-169154, NAS 1.26:169154
Contract NAG1-174

Chip-level modeling techniques in the evaluation of fault tolerant systems were researched. A fault tolerant computer was modeled. An efficient approach to functional fault simulation was developed. Simulation software was also developed.

N82-29968/6 PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Neutronenphysik und Reaktortechnik.
Evidence of Significant Bias in an Elementary Random Number Generator.
H. Borgwaldt, and V. Brandl. Mar 81, 17p DE82-780150, KFK-3107
In English; German Summary.

An elementary pseudorandom number generator for isotropically distributed unit vectors in 3 dimensional space was tested for bias. This generator uses the IBM-supplied routine RANDU and a transport rejection technique. The tests show clearly that nonrandomness in the pseudorandom numbers generated by the primary IBM generator leads to bias in the order of 1 percent in estimates obtained from the secondary random number generator. FORTRAN listings of 4 variants of the random number generator called by a simple test program and output listings are included for direct reference.

PB82-250895 CP **T99**
Office of Software Development, Falls Church, VA. Federal Software Testing Center.
FORTRAN Compiler Validation System Version 2.0 (1978).
Software,
L. Arnold Johnson. Aug 82, mag tape GSA/DF-82/003
Supersedes AD-A062 036.
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-250903.

The Federal Software Testing Center has recently released version 2.0 of a Compiler Validation System for the 1978 Fortran Standard (American National Standard Programming Language Fortran, X3.9-1978). Version 2.0 of the 1978 Fortran Compiler Validation System (FCVS) was designed to test the language as defined in the 1978 Fortran Standard (also known as Fortran 77). The test cases making up the system are for the most part stand alone programs. They are available on a source program library tape. A special program (written in Fortran) is provided which will automate the loading of each of the programs making up the FCVS on the users system, thus facilitating their use by any Fedeal Agency, private sector user or vendor...Software Description: The system is written in the Fortran programming language and is machine-independent. The computer memory requirement is 20K.

PB82-250903 PC **E06**/MF **A01**
Office of Software Development, Falls Church, VA. Federal Software Testing Center.

FORTRAN Compiler Validation System Version 2.0 (1978) User's Guide.
29 Jul 82, 170p OSD/FSTC-82/021, GSA/DF-82/003A
Supersedes AD-A062 037. For system on magnetic tape, see PB82-250895.

This is the user's guide for the Compiler Validation System for the 1978 Fortran Standard (American National Standard Programming Language Fortran, X3.9-1978). Version 2.0 of the 1978 Fortran Compiler Validation System (FCVS) was designed to test the full language as defined in the 1978 Fortran Standard (also known as Fortran 77). The test cases making up the system are for the most part stand along programs. They are available on a source program library tape. A special program (written in Fortran) is provided which will automate the loading of each of the programs making up the FCVS on the users system, thus facilitating their use by any Federal Agency, private sector user or vendor.

PB82-254822 CP **T05**
National Bureau of Standards, Washington, DC.
Analysis of Smoke Control Systems (ASCOSI).
Model-Simulation,
John H. Klote. 24 May 82, mag tape NBS/DF-82/003
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-254814.

This computer program was developed to analyze systems intended to control smoke in building fires. These systems include pressurized stairwells, and pressurized elevator shafts, zone smoke control systems and pressurized corridors. This program calculates air flows and differential pressures throughout a building. Assumptions and limitations of the program are also discussed. The appendices contain a program listing and examples...Software Description: The program is written in the FORTRAN programming language for implementation on a UNIVAC 1100/82 computer using the 1100 OS (37R2B) operating system. 40K bytes of core storage are required to operate the system.

PB82-262072 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Onderafdeling der Wiskunde en Informatica.
Descriptors for DAS,
J. van Katwijk, and J. van Someren. 1982, 32p 82-20

At the Delft University of Technology a compiler project has been started to implement the full Ada language. The project includes the definition of an Ada subset, called Delft Ada Subset DAS, and the implementation of this subset on a DEC PDP-11 computer running the UNIX timesharing system. A cheap and reasonably efficient model for dealing with the runtime representation of data of DAS programs is defined in this report.

PB82-262320 PC **A08**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa).
First South African APL Symposium (Eerste Suid-Afrikaanse APL Simposium),
F. Macaskill. 16 Feb 82, 162p CSIR-S-272, ISBN-0-7988-2315-1

In this paper APL is dissected to reveal some of its philosophical background, that hopefully throw some light on the arguments for or against the language. This paper borrows heavily from a paper by Iverson and Falkoff and one by Berry. Complete references can be found in the reference list at the end of this paper. The appendix of this paper gives the formal code for all the functions referred to in the text. Considerable care has been taken to make the utility functions as general as possible, even where this sometimes distracts from clarity.

PB82-262585 PC **A03**/MF **A01**
Physics Lab. RVO-TNO, The Hague (Netherlands).
EDITEX, a Telex Tex-editor Based on an 8085 Microprocessor,
N. W. Kaan, P. Feenstra, W. J. M. Geerdink, and W. A. Noz. 1982, 30p PHL-1980-06
Trans. of mono. EDITEX, een Tekst Editing Systeem voor een Telex Gebaseerd op een 8085 Microprocessor, n.p., Feb 80. See also N82-15795/0.

A microprocessor-based text editor is presented, specially developed to add text editing capabilities to currently used telex machines without any necessary technical changes. An overview is given of the hardware and software which were developed to realize this text editor. A User's Manual is added as an appendix to the report.

PB82-262833 PC **A14**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa).
Proceedings of the South African Computer Symposium on Research in Theory, Software, Hardware (2nd) Held at Pretoria on 27-30 October 1981,
G. Wiechers. 1981, 322p CSIR-S-231

The document contains papers from the 2nd South African Computer Symposium held in October, 1981 on the broad subjects of Information Theory, Computer Software and Hardware. Among the more specific topics covered are buffer storage, data base management, data structures, parallel programming, and multiprocessors.

PB82-264243 Not available NTIS
National Bureau of Standards, Washington, DC.
Database Semantic Integrity for a Network Data Manager.
Final rept.,
Elizabeth Fong, and Stephen R. Kimbleton. 1980, 28p
Contract F30602-77-0068
Pub. in Proceedings of National Computer Conference, Anaheim, CA, May 19-22, 1980 p261-288 1980.

Data in a database represents an abstraction or model of a 'real world' application. Effective use of the database requires that the contained data accurately describe the application. The field of semantic integrity is concerned with assuring that data is logically correct. Semantic integrity promises to be of even greater importance in the context of networked databases since local database management is likely to want strong assurances that remote, and therefore, presumably less knowledgeable users, will not impact database integrity. This paper: (i) categorizes semantic integrity features; (ii) identifies an approach to maintaining integrity in accessing multiple, remote, heterogeneous DBMSs; and (iii) describes an Experimental Semantic Integrity System (XSIS) now being designed and implemented at the National Bureau of Standards.

PB82-811266 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Software Maintenance. 1970-July, 1982 (Citations from the NTIS Data Base).
Sep 82, 207p
Supersedes PB81-806424 and PB80-806722.

Software maintenance activities are cited in the bibliography. Studies are included on resource allocation, benefit cost analysis, and management planning of computer software maintenance. (This updated bibliography contains 199 citations, 31 of which are new entries to the previous edition.)

PB82-811464 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Data Base Management. 1979-June, 1981 (Citations from the NTIS Data Base).
Sep 82, 237p

The advent of on-line systems, and the increasing problems of file organization, file maintenance, and file structures of date bases, has required the study and development of data base management systems. This bibliography of Federally-funded research cites the development of software packages and implementation of data base management systems into various information systems. (This updated bibliography contains 230 citations, none of which are new entries to the previous edition.)

PB82-811472 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Data Base Management. July 1981-July 1982 (Citations from the NTIS Data Base).
Sep 82, 148p
Supersedes PB81-807224 and PB80-808165.

The advent of on-line systems, and the increasing problems of file organization, file maintenance, and file structures of data bases, has required the study and development of data base management systems. This bibliography of Federally-funded research cites the development of software packages and implementation of data base management systems into various information systems. (This updated bibliography contains 141 citations, all of which are new entries to the previous edition.)

PB82-811571 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Data Base Languages. 1964-September 1982 (Citations from the NTIS Data Base).
Sep 82, 167p
Supersedes PB81-807711 and PB80-809866.

The bibliography cites studies on query languages, data definition languages, data manipulation languages, and data element directories/dictionaries. References are made to the CODASYL standard, as well as to many other data bases. Descriptions of the data elements of data bases, applied to a variety of areas are given. (This updated bibliography contains 171 citations, 16 of which are new entries to the previous edition.)

PB82-875196 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Storage Access Time. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 225p
Supersedes PB82-853367.

This bibliography contains citations concerned with technological developments in electronic circuitry components and design and its direct relation to access times of data from internal and secondary storage in microprocessing as well as central processing units. Various sized storage capacities, MOS devices, bipolar devices, magnetic bubble memory, multiple disk record and playback systems, and charge-coupled device memory are among the topics included. Brand names, manufacturers, and performance test evaluations are included. (This updated bibliography contains 225 citations, 43 of which are new entries to the previous edition.)

9C. Electrical and Electronic Engineering

DE82011512 MF **A01**
Oak Ridge National Lab., TN.
System Restoration: Deploying the Plan.
W. A. Johnson, C. N. Whitmire, J. P. Stovall, L. Mills, and J. C. Rodrigue. 1982, 10p CONF-820227-1
Contract W-7405-ENG-26
IEEE Power Engineering Society winter meeting, New York, NY, USA, 1 Feb 1982, Portions of document are illegible.
Available in microfiche only.

This paper is one of a series prepared for use in Current Operational Problems (COPs) forums with the goal of focusing the attention of the industry on high priority problems faced by those who are involved in the actual operation of power systems. The three short note reports in this paper provide insights into the problems of deploying a system restoration plan into an operating organization. Many aspects of the deployment problem are discussed, and some suggested solutions are provided. The short note reports presented here are intended to clarify the nature of these operational concerns and problems. It is the objective of COPs forums to solicit discussion and stimulate the creation of responsive solutions.

DE82012312 MF **A01**
Philadelphia Electric Co., PA. Engineering and Research Dept.
Evaluation of Underground DC Transmission Systems. Third Technical Progress Report, May 1, 1981-March 15, 1982.
16 Mar 82, 119p DOE/RA/50158-T1

Contract AC05-80RA50158
Portions of this report are illegible.
Available in microfiche only.

Progress in a program for evaluating underground dc transmission systems is reported. A basic load flow model was developed for a large ac power system. This model will be adjusted to produce representations for 4000, 8000, and 12,000 MW energy park. Load flow conditions for dc lines are being calculated. The stability of ac and dc are being examined. Short circuit duties are being calculated. Load flow computer runs are being made to demonstrate the suitability of developed ac and dc options. (ERA citation 07:043288)

DE82012724 PC **A02**/MF **A01**
Aerospace Corp., Los Angeles, CA.
Framework for Power-Network Analysis.
L. B. Jocic, C. K. Cretcher, and T. A. Trygar. 1981, 23p DOE/RA/50157-T1
Contract AC01-80RA50157

The framework for analysis of electric power networks proposed is motivated by the emerging concepts of power system security. Quantitative measures of system security can be derived within this framework on the basis of regions of operation in the space of system variables and parameters. Probabilistic aspects of load fluctuations and random faults in the network are included in the derivation of the probability number characterizing the level of security of each operating point. Additional research will be required for the practical application of this framework in planning and operating power systems. (ERA citation 07:043287)

DE82013631 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
Homeostatic Control: Economic Integration of Solar Technologies into Electric Power Operations and Planning.
R. D. Tabors. Jul 81, 25p MIT-EL-81-028
Contract AM01-76EI02295

The economic and technical interfaces between the electrical utility and the distributed, nondispatchable electric generation systems are only minimally understood at the present time. The economic issues associated with the interface of new energy technologies and the electric utility grid are discussed. Then the concept of Homeostatic Control is introduced and the use of such an economic concept applied to the introduction of nondispatchable technologies into the existing utility system is discussed. The transition and potential impact of a Homoeostatic Control system working with the existing electric utility system is discussed. (ERA citation 07:042740)

DE82014371 PC **A11**/MF **A01**
Dames and Moore, Bethesda, MD.
Underground Electric-Power Transmission-System Environmental Impact Assessment.
Mar 82, 229p DOE/ET/29163-2
Contract AC01-78ET29163
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The US Department of Energy, Division of Electric Energy Systems, has undertaken to identify the environmental issues and potential impacts associated with the installation of underground electric power transmission systems. This study reports the results of investigations into the advanced cable technologies being considered for future underground applications, as part of the development oriented research program of the Division of Electric Energy Systems. While the technology involves a high level of sophistication, there are relatively few impacts to the environment that are potentially significant, and of these none are inherently non-mitigable. Route planning, system design, and methods of construction and accident response can be pursued in order to minimize impacts where strict constraints are appropriate. (ERA citation 07:046618)

DE82014512 PC **A22**/MF **A01**
Brown Boveri Electric, Inc., Chalfont, PA.
1200-KV System Study.
Feb 82, 506p DOE/ET/29064-1
Contract AC01-78ET29064
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The 1200kV Systems Study Project consisted of two major tasks: definition of performance requirements for a 1200kV circuit breaker for use in a gas-insulated substation; and performance analysis of a 1200 kV insolator/disconnect switch for gas-insulated substation. For the first task, the performance requirements included: insulation requirements - 60 Hz, switching surge and lightning, both phase to ground and across the open breaker; prospective transient recovery voltage requirements related to fault current interrupting; an opening scheme capable of limiting phase to ground and across the breaker overvoltages resulting from line dropping and out of phase switching; a closing scheme capable of limiting line overvoltages during reclosing to 1.5 pu (2 percent level). The investigation of each of these items and of lightning characteristics and effects is discussed. The 1200 kV disconnect switch study analyzed bus energizing, bus de-energizing, transformer de-energizing, and the effect of hysteresis losses. Results from these analyses are presented. (ERA citation 07:043279)

DE82902159 MF **A01**
Bundesministerium fuer Forschung und Technologie, Bonn-Bad Godesberg (Germany, F.R.).
Electronic Systems for Home Appliances.
W. Barth, G. Bergmann, U. Buettner, H. Dausel, and K. Fischer. 1981, 196p BMFT-FB-T-81-027
In German.Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This report is confined to electronic systems in dishwashers and washing machines. On the basis of conventional programming sequences a complete electronic system for dishwashers was realized. This system is cost-competitive with electromechanical systems. Furthermore a modified linear compatible I exp 2 L-technology was developed wherein linear transistors with blocking voltages up to 60 V can be realized. Further developments for sensor-controlled washing machines include: new sensors (-principles), cleaning techniques, optical isolated triacs for power periphery, and studies for interactive operation. These investigations had results for near future applications and also showed possible applications fo new techniques available in the future. (ERA citation 07:043928)

PB82-263153 PC **A04**/MF **A01**
National Materials Advisory Board (NRC), Washington, DC.
Classification of Dusts Relative to Electrical Equipment in Class II Hazardous Locations.
Final rept.
Jul 82, 64p NMAB-353-4
Contracts DL-J-9-F-5-0070, PHS-NIOSH-210-78-0120

This document combines material presented in earlier National Materials Advisory Board reports and revises it to account for changes in the National Electrical Code that were made in 1981 and that reflect some of the recommendations of the Committee on Evaluation of Industrial Hazards.

PB82-263179 PC **A03**/MF **A01**
National Materials Advisory Board (NRC), Washington, DC.
Rationale for Classification of Combustible Gases, Vapors, and Dusts with Reference to the National Electrical Code.
Final rept.
Jul 82, 28p NMAB-353-6
Contracts DL-J-9-F-5-0070, PHS-NIOSH-210-78-0120

Electrical equipment that operates in an environment containing combustible materials must conform to requirements presented in Article 500 of the National Fire Protection Association's National Electrical Code (NEC). These requirements reflect the degree of combustion hazard created by the particular chemical compounds present in the equipment environment, and compounds are classified in groups that are indicative of the perceived explosion hazards. The Committee on Evaluation of Industrial Hazards of the National Research Council's National Materials Advisory Board has classified many hundreds of compounds in accordance with current NEC groupings. Although some tests were conducted on selected key compounds, the committee primarily considered the chemical similarity of compounds and other known flammability properties and relied heavily on the experience and intuition of its members. The committee also has recommended that the NEC grouping of dusts be changed in some ways and has reclassified dusts according to the modified version of the code. Nevertheless, the committee has serious reservations about the entire classification procedure and the precepts on which it is based, and these are discussed in this report.

9D. Information Theory

AD-A118 460/5 PC **A02**/MF **A01**
Florida Univ., Gainesville.
Analysis of a Function to Approximate the Envelope of a Bandpass Random Signal.
Contractor rept.,
Peyton Z. Peebles, Jr. 9 Mar 82, 21p HDL-CR-82-116-2
Contract DAAK21-81-C-0116

A simple algorithm is analyzed for calculating the envelope of a bandpass random signal. A general formula for the probability density function of the computed envelope is given. A specific example is worked out in detail for the case of zero-mean Gaussian bandpass noise. (Author)

AD-A118 613/9 PC **A04**/MF **A01**
Colorado State Univ., Fort Collins.
Viterbi Tracking of Randomly Phase-Modulated Data (and Related Topics).
Final rept. 1 Sep 79-15 Feb 82,
Louis L. Scharf. 10 Aug 82, 73p ARO-16437.9-EL
Contract DAAG29-79-C-0176
Prepared in cooperation with Rhode Island Univ., Kingston.

In this final report we formulate the problems of phase and frequency estimation as fixed interval smoothing problems. Forward dynamic programming algorithms are derived to find maximum posterior sequence estimates that pass likely sequences through the data. The algorithms extend the threshold usually associated with phase lock loops. The algorithms are applied to simultaneous phase estimation and data decoding in phase jitter channels. The resulting error probabilities are the lowest currently achievable. The results indicate that there are many problems in the domain of filtering and signal processing that can be profitably reformulated as sequence estimation problems. Our interest in likelihood leads us from frequency tracking to exact likelihood for autoregressive moving average (ARMA) data. Fast Kalman filtering algorithms are derived for constructing exact likelihood in multivariable ARMA models. Several interesting connections are established between Wold, Kolmogorov, Wiener, and Kalman representations of stationary time series. Ideas are proposed for associating spectra with linear transformations.

AD-A118 658/4 Not available NTIS
Physics Lab. RVO-TNO, The Hague (Netherlands).
Spectral Analysis: On the Usefulness of Linear Tapering for Leakage Suppression (Spektraal Analyse: Over het nut van een Lineaire Weging voor de Onderdrukking van Lekkage),
C. van Schooneveld, and D. J. Frijling. 3 Mar 80, 10p PHL-1981-35, TDCK-76152
Availability: Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-29 n2 p323-329 Apr 81 (No copies furnished by DTIC/NTIS).

No abstract available.

9E. Subsystems

AD-A118 459/7 PC **A05**/MF **A01**
McDonnell Douglas Research Labs., St. Louis, MO.
Algorithm for Surface of Translation Attached Radiators (A-STAR). Volume I. Formulation of the Analysis.
Final technical rept. 17 Mar 80-16 Oct 81,
L. N. Medgyesi-Mitschang, and J. M. Putnam. May 82, 88p RADC-TR-82-113-VOL-1
Contract F30602-80-C-0106

A general analytical formulation, based on the method of moments (MM) is described for solving electromagnetic problems associated with off-surface (wire) and

aperture radiators on finite-length cylinders of arbitrary cross section, denoted in this report as bodies of translation (BOT). This class of bodies can be used to model structures with noncircular cross sections such as wings, fins, and aircraft fuselages.

AD-A118 497/7 PC **A07**/MF **A01**
McDonnell Douglas Research Labs., St. Louis, MO.
Algorithm for Surface of Translation Attached Radiators (A-STAR). Volume II. User's Manual.
Final technical rept. 17 Mar 80-16 Oct 81,
L. N. Medgyesi-Mitschang, and J. M. Putnam. May 82, 139p RADC-TR-82-113-VOL-2
Contract F30602-80-C-0106
See also Volume 3, AD-A118 498.

A hierarchy of computer programs implementing the method of moments for bodies of translation (MM/BOT) is described. The algorithm treats the far-field radiation from off-surface and aperture antennas on finite-length open or closed bodies of arbitrary cross section. The near fields and antenna coupling on such bodies are computed. The theoretical development underlying the algorithm is described in Volume I of this report. (Author)

AD-A118 498/5 PC **A11**/MF **A01**
McDonnell Douglas Research Labs., St. Louis, MO.
Algorithm for Surface of Translation Attached Radiators (A-STAR). Volume III. Computer Codes.
Final technical rept. 17 Mar 80-16 Oct 81,
L. N. Medgyesi-Mitschang, and J. M. Putnam. May 82, 243p RADC-TR-82-113-VOL-3
Contract F30602-80-C-0106
See also Volume 1, AD-A118 459.

Listing of the computer codes implementing the algorithm for radiation and scattering from bodies of translation, described in Volumes I and II, is given. (Author)

AD-A118 550/3 PC **A02**/MF **A01**
Motorola, Inc., Scottsdale, AZ.
VLSI Array Processor.
Research and development status rept. 31 Mar-30 Jun 82,
Ed Greenwood. 19 Jul 82, 3p
Contract N00014-80-C-0693, DARPA Order-4001

The Arithmetic Processor Unit (APU) data base design check was completed. Minor design rule violations and design improvements were accomplished. The APU mask set has been fabricated and checked. Initial checking of all mask layers revealed a design rule problem in one layer. That layer was corrected, refabricated and checked out. The mask set has been delivered to the chip fabrication area. The fabrication process has been initiated. All work on the Array Processor Demonstration System (APDS) has been suspended at CHI until the additionally requested funding was received. That funding has been authorized and CHI will begin work on the APDS in July. The following activities are planned in the following quarter: 1) Complete fabrication of the first lot of VLSI APU devices. 2) Complete integration and check-out of the APDS simulator. 3) Complete integration and check-out of the APU breadboard. 4) Verify the VLSI APU wafer tests with the APU breadboard. 5) Complete check-out of the APDS using the APU breadboard. (Author)

AD-A118 584/2 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Calculation of Cosmic-Ray Induced Soft Upsets and Scaling in VLSI Devices.
Memorandum rept.,
P. Shapiro, E. L. Petersen, and J. H. Adams, Jr. 26 Aug 82, 43p Rept no. NRL-MR-4864

An analysis was carried out to explore the effect of size reduction on cosmic-ray induced errors in RAM's. This analysis uses a computational model and scaling procedure that are representative of those reported in current literature. Availability of various cosmic-ray environments make it possible to examine the effect of variations in the environment on predicted soft-upset rates. In addition, soft-upset rates have been calculated for the direct ionization due to protons in the radiation belts at an altitude of 600 nautical miles.

AD-A118 611/3 PC **A03**/MF **A01**
San Jose State Univ., CA. School of Engineering.
Sidelobe Modulation in Far-Field Radiation Patterns.
Final technical rept. Jun 81-Jun 82,
Gene Moriarty. 1 Jun 82, 28p TR-82-01, AFOSR-TR-82-0676
Grant AFOSR-81-0176

In this research, the following problem is addressed: How can low sidelobes in the distant electric field or power pa.tern be achieved via time-modulation of the element values in a linear phased array. Time-modulation of the N array element values can result in far-field patterns whose sidelobes are severely modulated. This procedure can produce sidelobes which on the average are very low. In this research, ON/OFF switchings are programmed in a predetermined sequence to produce a specified far-field pattern with equal and ultra-low sidelobe levels. In addition, the mainbeam of the far-field pattern is kept fairly fixed. A FORTRAN program is developed to produce ON and OFF times for this modulation scheme, given a specific value of array length (N) and a desired sidelobe level (PK).

AD-A118 660/0 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Pointing Performance of the 8300 Series Datron Antennas.
Final rept.,
James E. Kenney, and Alan P. Sharman. 16 Aug 82, 14p Rept no. NRL-8610

A measurement program was instituted to verify the pointing integrity of several antennas in a Navy communication system. The report verifies the antenna's conformance to the original specifications and concludes that they are suitable for a planned increase in the link frequency. (Author)

AD-A118 695/6 PC **A05**/MF **A01**
Rome Air Development Center, Griffiss AFB, NY.
Nulling in Linear Array Patterns with Minimization of Weight Perturbations,
Robert A. Shore, and Hans Steyskal. Feb 82, 76p Rept no. RADC-TR-82-32

An analysis is performed of nulling in linear array patterns subject to minimization of the weight perturbation. Both combined amplitude and phase perturbation, and phase-only perturbation are treated. The solutions obtained are interpreted in terms of cancellation beams superimposed on the initial pattern. (Author)

AD-A118 722/8 PC **A02**/MF **A01**
Rome Air Development Center, Griffiss AFB, NY.
Phase-Only Nulling as a Least-Squares Approximation to Complex Weight Nulling,
Robert A. Shore. May 82, 21p Rept no. RADC-TR-82-129

A solution is presented to the problem of obtaining a least-squares fit of phase-only array weight perturbations to a set of combined phase and amplitude perturbations calculated to impose pattern nulls at prescribed sidelobe directions. It is shown that the desired least-squares fit is accomplished by taking only the phase part of the combined phase and amplitude perturbations. This method of phase-only nulling is compared in effectiveness with other phase-only pattern synthesis methods.

AD-A118 783/0 PC **A03**/MF **A01**
Erie Technological Products of Canada Ltd., Trenton (Ontario).
Manufacturing Methods and Techniques for Miniature High Voltage Hybrid Multiplier Modules.
Quarterly progress rept. no. 11 and 12, 1 Oct 80-31 Dec 82,
M. I. Matuszewski. 31 Dec 82, 44p
Contract DAAB07-76-C-0041

The assembly of a multiplier with a notched capacitor was evaluated. The thickness of the capacitor was maintained to ensure high breakdown voltage. (Author)

AD-A118 847/3 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Solid State Research: 1982-1.
Quarterly technical summary rept. 1 Nov 81-31 Jan 82,
Alan L. McWhorter. 15 Feb 82, 124p ESD-TR-82-010
Contract F19628-80-C-0002

This report covers in detail the solid state research work of the Solid State Division at Lincoln Laboratory for the period 1 November 1981 through 31 January 1982. The topics covered are Solid State Device Research, Quantum Electronics, Materials Research, Microelectronics, and Analog Device Technology.

DE82012746 MF **A01**
Illinois Univ. at Urbana-Champaign.
Fastbus Non-Forced Air-Cooling Tests.
R. W. Downing. Jul 81, 13p DOE/ER/01195-T3, COO-1195-464
Contract AC02-76ER01195
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Tests were conducted on a closed box with all walls at room temperature with heat test units positioned between the plates with small cardboard spacers. The rear of the test unit was taped closed, and no external air was allowed to flow through the box. Outside wall temperature was monitored for all tests. Tests were performed to test a possible method of conducting heat away from high powered I.C.'s in a closed chamber. The effect of a brass strip attached to the top of the I.C. and making mechanical contact with the wall of the box is tested. Tests show that some heatsinking technique is needed for I.C.'s of more than 3/4 watt dissipation. It is concluded that conventional air-cooled printed circuit boards can be effectively cooled by simply installing them in a cool-walled box. The chassis construction could also consist of card slots divided by water filled plates similar to refrigeration walls. Problems relating to wire-wrap modules are addressed. (ERA citation 07:044573)

DE82012873 MF **A01**
Sandia National Labs., Livermore, CA.
Screening Tests of Conformally-Coated Printed Wiring Boards.
M. D. Skibo, and W. R. Even. Mar 82, 25p SAND-82-8215
Contract AC04-76DP00789
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Identical printed wiring boards (PWB) were fabricated using glass-triazene as substrates and were conformally coated with either conothane or parylene. The boards were then placed in sealed canisters along with TATB and other organic materials found in recent weapon systems. While subjected to electrical potentials of 120V and 250V, these PWBs were either aged at 60 exp 0 , 70 exp 0 , or 80 exp 0 or temperature cycled for as long as 16 months. The resistivities of the boards were precisely measured before and after aging to determine the effect of time, temperature, and environment on the electrical characteristics of board materials. In all cases board resistivity increased with temperature and duration of test. This increase was believed to be related to either a reduction in water content in the board substrate or a completion of cure of the conformal coating with time elevated temperature. Both mechanisms would result in a reduction in conductive species. In spite of high humidity levels, no evidence of current - activated filament formation between adjacent active circuit paths on aged PWBs was seen. Similarly, soldered contacts were free of thermally-induced fatigue damage after as many as 500 cycles between -54 and 70 exp 0 C at 1 cycle/day.

N82-29541/1 PC **A07**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Lsi/Vlsi Design for Testability Analysis and General Approach.
A. Y. Lam. 1 Jun 82, 141p NASA-CR-169145, JPL-PUBL-82-50
Contract NAS7-100
Sponsored by Naval Ocean Systems Center.

The incorporation of testability characteristics into large scale digital design is not only necessary for, but also pertinent to effective device testing and enhancement of device reliability. There are at least three major DFT techniques, namely, the self checking, the LSSD, and the partitioning techniques, each of which can be incorporated into a logic design to achieve a specific set of testability and reliability requirements. Detailed analysis of the design theory, implementation, fault coverage, hardware requirements, application limita-

tions, etc., of each of these techniques are also presented.

N82-29959/5 PC **A05**/MF **A01**
Texas Instruments, Inc., Dallas. Central Research Labs.
Advanced Data Processing IC Development.
Final Report, 29 Aug. 1980 - 31 Dec. 1981.
C. Hewes, and C. R. Hewes. 21 Jan 82, 78p NASA-CR-165898, NAS 1.26:165898
Contract NAS1-16116

The state of the art in signal processing through the use of advanced VLSI technology is discussed. Programmability, low power, and very high throughput are included. General purpose programmable signal processing microcomputers with on-board array multipliers, high bandwidth I/O, and considerable on-chip memory are considered. This capability appears to e feasible with the advent of advanced CMOS technology with 1.0 to 1.5 micrometer pattern sizes. A very high performance CMOS 16 x 16 array multiplier/accumulator was designed. The multiplier is capable of operating at a 40 MHz rate when used in a pipeline mode or at a 25 MHz rate in non-pipelined mode.

PAT-APPL-6-377 517 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Wideband Linear, Low-Noise CCD Buffer Apparatus.
Patent Application,
Donald R. Lampe. Filed 12 May 82, 16p AD-D009 633/9
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A CCD buffer apparatus utilizing a minimally capacitive-loading charge sensing transistor to couple the output from a CCD unit to a constant current source differential amplifier unit. The gain of the differential stage is enhanced by a mirror image MOS enhancement FET pair in the collector circuit of the differential stage. A feedback loop is utilized in the output of the buffer apparatus to aid in signal tracking between the input and the output. (Author)

PAT-APPL-6-379 807 PC **A03**/MF **A01**
Department of the Air Force, Washington, DC.
Universal Control Grid Modulator.
Patent Application,
Daniel G. Miller. Filed 19 May 82, 26p AD-D009 630/5
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

High voltage FET's (field effect transistors) are used to modulate a traveling wave tube, which makes it possible to achieve fast rise, fall and delay characteristics, and very long pulsewidths to CW because of their low drive requirements to maintain the on condition. The low and high voltage portions of the modulator are coupled via special transformers having only one or two turns for each winding on torroidal cores. Since such transformers are not adequate for long pulse widths, the gate to source capacitance of a high voltage FET is charged with a short pulse from one transformer and held there by a blocking diode until it is removed by the off drive. To obtain pulse widths all the way out to CW, a regeneration circuit is incorporated in the low voltage circuitry so that if the commanded on time goes beyond a maximum time, successive pulses are generated to maintain the voltage between gate and source of the on FET. (Author)

PAT-APPL-6-383 034 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
High Speed Sample and Hold Circuit.
Patent Application,
Robert D. Moran. Filed 28 May 82, 15p AD-D009 651/1
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A high speed sample and hold circuit which holds the peak value of a narrow pulse for a period of time at least three orders of magnitude larger than the pulse duration. The circuit is constructed with a diode bridge having an input, an output a first drive corner and a second drive corner. The diode bridge is switched on by two transistors configured as a high speed, pulsed current source and connected to the first and second drive corners of the bridge. The bridge is reverse biased by two resistors which are also connected to the first and second drive corners such that each resistor is in series with the bridge but is in parallel with the transistors. The circuit is provided with a storage capacitor in the output of the bridge which is isolated from the output load by a buffer. In operation, the transistors are turned on by simultaneous voltage pulses, the transistors then supply high speed, pulsed current to the bridge and the bridge is switched on and balanced. When a transient voltage signal to be sampled is supplied to the bridge input, the bridge becomes unbalanced such that current flows in or out of the storage capacitor until the bridge is unbalanced. (Author)

PAT-APPL-6-383 918 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
VMOS-FET IMPATT Diode Pulse Bias Circuit.
Patent Application,
Ronald Scott Best. Filed 1 Jun 82, 22p AD-D009 642/0
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This invention describes a VMOS-FET, IMPATT diode pulse bias circuit designed to provide a Gallium Arsenide IMPATT diode with a specified operating voltage and current under required conditions to generate an RF pulse. (Author)

PAT-APPL-6-397 340 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Planar Doped Barrier Transferred Electron Oscillator.
Patent Application,
Roger J. Malik, and Gerald J. Iafrate. Filed 12 Jul 82, 13p AD-D009 652/9
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A transferred electron semiconductor device in the form of an oscillator, for example, is fabricated by a molecular beam epitaxy growth process wherein a plurality of semiconductor layers are sequentially grown on a planar substrate. A pair of ohmic contacts are formed on the outer surface of the substrate and the uppermost layer with the resulting structure including two distinct intermediate semiconductor regions, the first being a drift region adapted to exhibit a differential negative resistance due to the transferred electron effect, and the second being a planar doped barrier region for accelerating electrons into the upper valley and injecting them into the drift region. By the use of a planar doped barrier a more uniform electric field is obtained along with a controlled lower barrier height whereby the transfer of electrons to the upper conduction band satellite valley can be made to occur over much shorter times and distances thus extending the upper frequency range of operation. (Author)

PATENT-4 315 266 Not available NTIS
National Aeronautics and Space Administration, Houston, TX. Lyndon B. Johnson Space Center.
Spiral Slotted Phased Antenna Array.
Patent,
H. Ellis, Jr. Filed 25 Jul 80, patented 9 Feb 82, 7p N82-27558/7, PAT-APPL-6-172 099
Supersedes PAT-APPL-6-172 099, N80-29543 (18 - 20, p 2685).Sponsored by NASA.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

A flush mounting, cavity-backed, dual orthogonal slot antenna for aircraft and space vehicles is described. Improved radiation pattern characteristics are obtained by making the spiral slot pattern elliptical in the aperture plane. A cavity and a flanged aperture plate are configured such that one slot pair is orthogonal with respect to another slot pair within the aperture plate. Coaxial split-tube baluns are used to drive the junctions between corresponding slot pairs. An optional cavity dielectric is provided and a drive coupling arrangement includes a four port comparator hybrid having sum and difference ports respectively, for alternate excitation to produce a single lobe or a double lobe pattern with null. Switching apparatus is provided to connect a common terminal to either of the ports.

PATENT-4 328 498 Not available NTIS
Department of the Navy, Washington, DC.
Phased Array Antenna for Satellite.
Patent,
Max N. Yoder. Filed 21 May 70, patented 4 May 82, 9p AD-D009 664/4, PAT-APPL-048 590
Supersedes PAT-APPL-048 590-70.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A spin stabilized, earth orbitting satellite having a phased array antenna capable of radiating a plurality of steered electromagnetic beams to predetermined earth locations. The antenna array extends around the satellite and is made up of individual elements which are energized through semiconductor diode devices by electron beams. The electron beams are controlled by fields having the same frequency as the spin frequency of the satellite. (Author)

PATENT-4 328 554 Not available NTIS
Department of the Navy, Washington, DC.
Programmable Frequency Synthesizer (PFS).
Patent,
Joseph L. Mantione. Filed 3 Jul 80, patented 4 May 82, 10p AD-D009 623/0, PAT-APPL-6-165 598
Supersedes PAT-APPL-6-165 598, AD-D007 453.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A programmable frequency synthesizer (PFS) consists of three serially connected stages; an accumulator, a triangle converter, and a sine shaper. The accumulator is the frequency-generating stage of the synthesizer. It consists of an input latch to store the binary programmed frequency, an adder, an output latch to store the output of the adder, and a clock oscillator. The output frequency of the accumulator can be directly scaled by changing its clocking frequency. The square wave output of the accumulator is divided in frequency by the triangle converter, which produces a triangularly shaped staircase waveform. The sine shaper stage employs diode limiters and filters to produce low-harmonic sinusoids from the triangular staircase. (Author)

PATENT-4 333 079 Not available NTIS
Department of the Navy, Washington, DC.
Doppler Signal Processing Circuit.
Patent,
John O. Dick, Joe A. McKenzie, and William C. Bradford. Filed 21 Jul 70, patented 1 Jun 82, 6p AD-D009 621/4, PAT-APPL-063 975
Supersedes PAT-APPL-063 975-70.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A signal processing circuit for producing a warhead firing pulse when the warhead is in a position to cause maximum target damage in a missile, target encounter. The received doppler signal is processed through filter circuits and a first band-pass amplifier. A second band-pass amplifier tuned to pass a narrow portion of the frequency spectrum above the doppler signal is connected in parallel with the first amplifier and its output signal is used to vary the threshold bias to compensate for the presence of extremely noisy signals. (Author)

PB82-262148 PC **A04**/MF **A01**
Siemens A.G., Munich (Germany, F.R.). Unternehmensbereich Bauelemente.
Multi-Function Liquid Crystal Displays.
Martin Bechteler. 1982, 68p BMFT-FB-T-80-181
Trans. of mono. Mehrfunktionen-Fluessigkristallanzeigen, n.p., Feb 80. See also N82-13957/7.

Large area liquid crystal displays up to 400 cm square were developed capable of displaying a large quantity of analog and digital information, such as required for car dashboards, communication systems, and data processing, while fulfilling the attendant requirements on view tilt angle and operating temperature range. Items incorporated were: low resistance conductive layers deposited by means of a sputter-machine, preshaped glasses and broken glassfibers, assuring perfect parallelism between glass plates, rubbed plastic layers for excellent electrooptical properties, and fluorescent plates for display illumination in bright sun-

light as well as in dim light conditions. Prototypes are described for clock and automotive applications.

PB82-263906 PC **A04**/MF **A01**
Siemens A.G., Munich (Germany, F.R.). Unternehmensbereich Bauelemente.
Monolithic Integration of UHF-MOSFET-Structures and Bipolar UHF Transistors,
Wolfgang Mueller. 1982, 56p BMFT-FB-T-80-172
Trans. of mono. Monolithische Integration von UHF-MOS-FET-Strukturen und bipolaren UHF-Transistoren, n.p., May 80. See also N81-33420/3.

Compatible UHF MOSFET and bipolar monolithic technology for application to FM and television electronic tuners was studied. A UHF MOS tetrode which features very low noise and high transductance, and MOS triodes and UHF bipolar transistors feasible for integration were developed. Both techniques are combined, to produce an integrated UHF balanced consisting of two bipolar transistors and one MOS triode, using ion implantation techniques. It is demonstrated that dc dynamic, functional measurements take considerable advantage of the BIMOS mixer circuit.

PB82-265695 Not available NTIS
National Bureau of Standards, Washington, DC.
Accurate Evaluation of a Millimeter Wave Compact Range Using Planar Near-Field Scanning.
Final rept.,
A. G. Repjar, and D. P. Kremer. May 82, 9p
Pub. in Institute of Electrical and Electronics Engineers Transactions Antennas Propag. AP-30, n3 p419-425 May 82.

Significant progress in recent years has been made on planar near-field measurements for antenna calibrations. Such measurements are also useful in the alignment and evaluation of compact ranges because they provide more information than a limited number of analogue plots in one dimension. Contour plots of amplitude and phase data obtained from more complete 2-dimensional measurements precisely and accurately locate sources of problems in the range reflector, with phase contour plots being more useful as diagnostic tools.

PB82-266198 PC **A04**/MF **A01**
Allgemeine Elektricitaets-Gesellschaft AEG Telefunken, Ulm (Germany, F.R.).
Gas Discharge Matrix Displays.
Kurt Fahrenschon, Werner Dirr, Wolfgang Hellwig, Hildegard Keiner, and Guenther Peppel. Aug 82, 54p BMFT-FB-T-80-082
Trans. of mono. Rasteranzeigeschirm in Gasentladungstechnik, n.p., Nov. 80.

The theoretical and technological principles of pulsed gas discharge matrices with inherent memory have been investigated. Based on results from study NT 474, the quality of the panel consisting of a priming channel, driftspace and a display cell has been enhanced. For the display cell, a design using a wire cathode is the most suitable. Time delay investigations indicate that certain ignition of the discharge channels can be obtained. The luminous density of the display panel developed exceeds that of all others to date.

PB82-266867 PC **A03**/MF **A01**
Siemens A.G., Munich (Germany, F.R.).
Further Developments in Integrated Circuit Assembling Technology,
H. Ullrich. Sep 82, 30p BMFT-FB-T-80-179
Trans. of Weiterentwicklung der IS Montagetechnologie, n.p., 62p Dec 80. See also N82-13369.

Recent developments aiming at full automation in the assembling technology of plastic encapsulated integrated circuits (IC) are described, covering die separation, chip adhesion and wire bonding. For IC die separation in individual chips, a diamond sawing procedure which replaces the traditional scratch and break technique is proposed. Die attachment by means of a silver-filled adhesive was extended to MOS and power devices. A half-automated universal chip adhesion machine was designed and tested. A positioning system based on chip edge pattern recognition was developed. The protype of a fully automated wire bonding system was successfully tested. The technical and economical advantages of these improved technologies are discussed.

PB82-811530 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phased Arrays. March, 1976-May, 1981 (Citations from the NTIS Data Base).
Sep 82, 325p

The design, performance, radiation patterns, and applications of phased arrays are presented in these Federally-sponsored research reports. Applications include communications, radar, optical, spacecraft, and navigational aids. (This updated bibliography contains 318 citations, none of which are new entries to the previous edition.)

PB82-811548 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phase Arrays. June, 1981-May, 1982 (Citations from the NTIS Data Base).
Sep 82, 57p
Supersedes PB81-807083 and PB80-808041.

The design, performance, radiation patterns, and applications of phased arrays are presented in these Federally-sponsored research reports. Applications include communications, radar, optical, spacecraft, and navigational aids. (This updated bibliography contains 50 citations, all of which are new entries to the previous edition.)

PB82-811555 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phased Arrays. 1978-June, 1981 (Citations from the Engineering Index Data Base).
Sep 82, 253p

The bibliography cites reports from worldwide research on the design, performance, radiation patterns, and applications of phased arrays. Applications include radar, communications, optical, electronic countermeasures, acoustic, aircraft, and spacecraft. (This updated bibliography contains 246 citations, none of which are new entries to the previous edition.)

PB82-811563 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phased Arrays. July, 1981-July, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 72p
Supersedes PB81-807091 and PB80-808058.

The bibliography cites reports from worldwide research on the design, performance, radiation patterns, and applications of phased arrays. Applications include radar, communications, optical, electronic countermeasures, acoustic, aircraft, and spacecraft. (This updated bibliography contains 65 citations, all of which are new entries to the previous edition.)

PB82-875527 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Phase Locked Loop. May, 1974-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for May 74-Sep 82.
Sep 82, 238p
Supersedes PB80-851587.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the theory, design, testing, development, performance characteristics, and applications of various phase locked loop circuits and devices. Topics include stability analysis and control systems for phase locked loops, frequency synthesizers and estimators, phase detectors, and phase locked loop modulation and demodulation. (This updated bibliography contains 254 citations, 83 of which are new entries to the previous edition.)

PB82-876012 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Schmitt Triggers: Performance and Applications. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 164p
Supersedes PB81-861957.

This bibliography contains citations concerning the performance and applications for schmitt triggers or schmitt limiters. Circuits employing schmitt triggers are covered extensively. (This updated bibliography contains 176 citations, 33 of which are new entries to the previous edition.)

PB82-876053 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Three-Dimensional Display Systems: Equipment and Applications. 1976-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1976-Sep 82.
Sep 82, 184p
Supersedes PB81-864761.

This bibliography contains citations concerning stereoscopic video systems(3-D). Systems requiring special glasses or viewing aids and systems with no specific viewing aids are discussed. Application of 3-D technology to industry, medicine, education and entertainment are considered. 3-D display techniques and their limits are also discussed. (This updated bibliography contains 182 citations, 58 of which are new entries to the previous edition.)

PB82-876061 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Three-Dimensional Display Systems: Equipment and Applications. 1976-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1976-Sep 82.
Sep 82, 160p
Supersedes PB81-864738.

This bibliography contains citations concerning stereoscopic display systems. Many display systems, including isometric imaging, liquid-crystal, steromatrix, 3-D, and holographic displays are described and evaluated. Space perception and visual perception are also discussed. The applications of stereoscopic display systems to space, industrial and medical technology are also considered. (This updated bibliography contains 131 citations, 24 of which are new entries to the previous edition.)

10.

ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

DE82008222 MF **A01**
Biphase Energy Systems, Santa Monica, CA.
Field-Test Results for a Two-Phase Nozzle Operating on a Salton Sea Geothermal Resource, November 20-December 19, 1980.
Jan 81, 42p DOE/ET/27124-T2
Contract AC03-79ET27124
Portions of document are illegible.
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The following are described: the test system, the data acquisition system, operating procedure and data acquisition, procedure for taking data, shutdown procedure, discussion of nozzle frequency, the effect of noncondensables, the results of non-condensable evaluation, the thermodynamic effect of dissolved solids, and a brief summary of scale tests. (ERA citation 07:046484)

DE82008298 PC **A02**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.

Current California Legislative and Regulatory Activity Impacting Geothermal Hydrothermal Commercialization: Monitoring Report No. 3. Report No. 1023.
20 Jul 80, 21p DOE/ET/27241-T8
Contract AC03-79ET27241

The current legislative activity covers the following: federal funds, state financial incentives, air quality bills, transmission line access, state energy agency reorganization, and state energy taxes. Current regulatory activities of the California Energy Commission, and the Lake County Air Pollution Control District are reviewed.

DE82008498 PC **A04**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
Transmission-Line Access for Hydrothermal Target Prospects in the Five Pacific Rim States: A Legal/Institutional Analysis. Report No. 1022.
20 Jun 80, 52p DOE/ET/27241-T10
Contract AC03-79ET27241

Transmission line access is discussed as a legal and institutional problem impacting geothermal commercialization. A legal and regulatory overview is presented starting with the Federal Power Act of 1935. The legal and institutional attributes of both Bonneville Power Authority and the California Power Pool as well as their satellite transmission systems are examined, with an eye towards the setting that they, as institutions, will present to geothermal commercialization. The physical realities of the problem are presented for the Geysers, Mono-Long Valley and Coso, Imperial Valley, and Oregon.

DE82008502 PC **A03**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
Review of California's Geothermal-Related Legislative and Regulatory Activity Through 1979. Report No. 1116.
20 Dec 79, 42p DOE/ET/27241-T5
Contract AC03-79ET27241

The findings of the 1977 State Geothermal Resources Task Force are divided into four main categories: well siting, power plant siting; environmental problems; and miscellaneous areas. California's 1978 legislation is described using the same categories. The key difficulties still harassing the state's geothermal industry are described including: control over air quality at the Geysers; powerplant finance; a binary cycle demonstration; federal land use decisions; and miscellaneous concerns.

DE82008503 PC **A02**/MF **A01**
JM Energy Consultants, Inc., Los Angeles, CA.
Current California Legislative and Regulatory Activity Impacting Geothermal Hydrothermal Commercialization: Monitoring Report No. 2. Report No. 1020.
20 Apr 80, 21p DOE/ET/27241-T4
Contract AC03-79ET27241

The progress of four bills relating to geothermal energy is reported. The current regulatory activities of the California Energy Commission, the Lake County Planning Commission/Lake County Air Pollution Control District, the Governor's Office of Planning and Research, the State Lands' Commission, and the California Public Utilities Commission are reviewed.

DE82009399 PC **A03**/MF **A01**
Northern Research and Engineering Corp., Woburn, MA.
Test Plan Research and Development for Improved Efficiency, Small Steam Turbine, Project No. 1380, Phase II, Revision A.
Aug 81, 37p DOE/ET/15426-T8
Contract AC02-79ET15426

Northern Research and Engineering Corporation together with Terry Steam Turbine Corporation is currently engaged in a development program aimed at demonstrating that a family of high efficiency radial inflow steam turbines (RIT) can be developed to meet the demands of the small (500 to 5000 hp) steam turbine market, such that significant market penetration, hence significant savings in the nation's use of energy, will result. The program is being conducted in two phases. During Phase I, recently completed, the market for small steam turbines was examined and the family of radial inflow turbines best suited to penetrate the market was identified. Phase II is concerned with the testing of small steam turbines to meet market requirements. The tests specified include component testing, mechanical rotating testing, and performance testing. The component and mechanical rotating tests are designed to assure the integrity of the machine prior to performance testing and verify the results of engineering analyses employed in its design. The performance tests are meant to demonstrate the predicted performance which has been the rationale for this program. The purpose, requirements, procedures and completion schedule for each test are described. (ERA citation 07:047621)

DE82012232 MF **A01**
Solar Energy Research Inst., Golden, CO.
Solar and Renewable-Resource Technology Characterization and Cost-Assessment Source Book. Chapters 18-25.
1981, 185p DOE/NBM-1008
Contract AC02-77CH00178
Portions of document are illegible.
Available in microfiche only.

Estimates of the cost of delivered energy from a selected number of solar/renewable resource technologies are provided and these are compared with the costs of conventional alternatives meeting the energy needs in comparable applications. Technology characterizations and cost assessments of representative systems relating to 23 solar and renewable resource technology/application pairs were performed. For each pair, identical assessments were also made for representative conventional (e.g., fossil fuel) competing systems. The 23 technology/application pair are listed. A comprehensive description of the study methodology and the results of the 23 assessments is provided as following: system engineering descriptions, technical performance data, economic analysis assumptions, economic/financial performance assessment results, and sources of the data.

DE82012416 MF **A01**
Institute for the Human Environment, San Francisco, CA.
Toward Home Energy Management. A Guide to Community Network Building.
Dec 81, 43p DOE/CS/22603-T1
Contract FG03-81CS22603
Available in microfiche only.

A way is illustrated to bring people together for mutual support, sharing of resources, and collaboration on community-wide programs to better manage home energy use. Ideas for actions that can be taken by any neighborhood or community interested in making itself more self reliant and more efficient in using limited energy resources are given. The method consists of planning and designing a first workshop, bringing together people with influence, creating a task force to design next steps, holding a second workshop for solving problems identified earlier, and follow-through. The importance of home energy management is discussed briefly, and sources of key services are given. Barriers to cooperation are listed and ways are suggested to overcome them. People to include are identified. The value of follow-up is discussed. Three case studies are presented.

DE82012571 PC **A10**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Assessment of Energy Saving Technologies with Potential for Applications in US Industries.
Jan 82, 216p DOE/NBB-0002
Contract AC06-76RL01830
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The purpose of this study was to assess and evaluate information on energy technologies displayed at international trade shows. The primary objective of this evaluation was to identify technologies that had potential for saving energy in applications in US industries. These technologies are identified and concise summaries on potential energy savings, economics, basic operational considerations, and potential applications are prepared. These summaries are contained in this Technical Assessment Manual. A secondary objective of this study is to determine whether international trade shows can provide a convenient and useful forum for the identification of energy saving technologies which could have wider applications in US industry. Forty-four technologies were chosen for inclusion in the Manual which are grouped into the following catgories: heat recovery devices, heat exchangers, heat pumps, and various other technologies. Some of the technologies include: a low energy drying system, solid waste in cement manufacturing, boiler fuel optimization system, multi-fuel boiler plant, coal combustion efficiency improvements, etc.

DE82012786 MF **A01**
Solar Energy Research Inst., Golden, CO.
Solar Energy Meteorological Research and Training Site Program. Second Annual Report.
Jan 82, 109p SERI/SP-290-1478
Contract AC02-77CH00178
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Reports of the work of each of the eight regionale centers in the program are included. A separate abstract was prepared for each report.

DE82013809 PC **A02**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Design of the Glenwood Springs Downhole Heat Exchanger.
P. Chiu. Apr 82, 24p EGG-GTH-5812
Contract AC07-76ID01570

A heat exchanger has been designed to obtain 250,000 Btu/hr from a 20-in.-diameter geothermal well at various brine temperatures. The system consists of a 10-in.-diameter plastic pipe to promote convective flow in the well and a 4-in.-diameter, Schedule 40 steel U-tube containing distilled water to extract the energy. Subject to the validity of the major assumptions, the required lengths of one leg of the U-tube at various brine temperatures are 34 ft (150 exp 0 F), 42 ft (140 exp 0 F), 54 ft (130 exp 0 F), and 75 ft (120 exp 0 F) for a mean working fluid temperature of 90 exp 0 F. (ERA citation 07:043174)

DE82015028 PC **A13**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Identification of Energy Conservation Research Opportunities: A Review and Synthesis of the Literature.
W. J. Hopp, G. J. Hane, W. E. Gurwell, S. G. Hauser, and R. E. Williford. Mar 82, 281p PNL-3966
Contract AC06-76RL01830
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Thirty-eight studies of energy conservation research opportunities are reviewed. The 38 studies chosen for review include many of the major efforts in the identification of energy conservation research and development (R and D) opportunities and provide a representative sample of the types of studies that have been performed. The sample includes studies that focus on specific energy use (e.g., auto transport), as well as studies that focus on specific types of research (e.g., materials science). The sample also includes studies that can be further contrasted in terms of long-term vs. short-term projects, evolutionary vs. revolutionary ideas, generic vs. process-specific activities, and technology base research vs. hardware development. Each of these perspectives contributes toward assuring coverage of the breadth of energy conservation R and D opportunities. In each review the technical or end-use focus is described, the research ideas identified in the study are listed, and a critical summary is given. The reviews also indicate whether the studies present end-use consumption data, estimate potential energy savings, estimate times to commercialization, summarize existing research programs, or describe the identification methodology. In Section 2.0 the various research studies are compared. In Section 3.0 the characteristics of an aggregate list of research ideas are discussed. The characteristics were collected from the research opportunities studies, which are included in Appendix A. Appendix A contains a compilation of energy conservation R and D opportunities arranged by energy end-use applications. Appendix B contains an outline of the format followed in writing the critical reviews of the studies, the individual study reviews, and the extended bibliography of 88 studies that describe energy conservation research opportunities.

DE82015090 PC **A04**/MF **A01**
Los Alamos National Lab., NM.
Projection of Soviet Energy Use to 1990. Policy Research Series No. 3.
W. G. Davey, and R. E. Pendley. Jan 82, 57p LA-9153-MS
Contract W-7405-ENG-36

Actual Soviet energy use for the years 1950 to 1975 was used as a basis for projecting energy use to 1990.

Two projections were made, one based upon continuation of historical usage patterns and a second that incorporated possible changes in these patterns. These changes were based upon such factors as changing energy availability, costs, and the political/economic objectives of the Soviet government. In this latter case, the potential for considerably reduced energy consumption is strikingly clear.

DE82015229 MF **A01**
Federal Energy Regulatory Commission, Washington, DC. Office of Electric Power Regulation.
Hydroelectric Power Resources of the United States: Developed and Undeveloped.
1 Jan 80, 259p FERC-0070
Portions of document are illegible.
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This publication, the eighth in this series issued by the Federal Energy Regulatory Commission (or its predecessor, Federal Power Commission), presents data as of January 1, 1980, on the capacity, generation, and other characteristics of the developed and undeveloped hydroelectric power resources of the United States. Principal statistics are shown by water resources regions and river basins and by geographic divisions and states. This series of reports is the only single source of such data in the United States. Earlier editions were published for the years 1953, 1957, 1960, 1964, 1968, 1972, and 1976. Expanded coverage is given to hydroelectric developments under construction and those projected for future construction. An added section on small-scale hydroelectric development is included. Also, additional attention is given to legislative enactments that preclude hydroelectric power developments in certain river reaches. Additional information on the undeveloped hydroelectric power potential is continually being provided by new surveys of river basins by various federal agencies, states, federal-state entities, and others. These surveys consider the possible development of water resources for a number of purposes, including hydroelectric power production. The studies take account of the growing need for larger hydroelectric installations to operate at low plant factors for peaking purposes and also small-scale projects to meet certain community, industrial, and rural needs. The current listings of undeveloped sites reflect the results of such river basin studies. (ERA citation 07:046113)

DE82015247 MF **A01**
Solar Energy Research Inst., Golden, CO.
Estimates of Air and Water Pollutants and Energy Consumption from the Production of Raw Materials Used in Wind-Energy Systems.
W. L. Bider, L. E. Seitter, L. E. Bertuglia, and R. G. Hunt. Apr 82, 222p SERI/TR-09230-1
Contract AC02-77CH00178
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Data are presented which quantify the energy and environmental impacts associated with the manufacture of wind energy system components. The components are examined in terms of the basic materials used: steel, aluminum, copper, fiberglass, concrete and wood. Impact data quantify energy consumption, air and water pollutant emissions, solid waste generation, and transportation impacts per 1000 pounds of product made from each material. The detailed industrial process data from which total material impacts were calculated are appended for each material.

DE82015777 PC **A18**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Current Data from the Keahole Point, Hawaii, OTEC Benchmark Sites, June 1980-April 1981. Part I. June 1980-December 1980; Part II. December 1980-April 1981.
D. Frye, K. Leavitt, and E. K. Noda. Oct 81, 404p DOE/NBM-2015777
Contract W-7405-ENG-48
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Physical oceanographic measurements made off Keahole Point, Hawaii between June and December 1980 and then between December 1980 and April 1981 are presented. These data include current, temperature, and pressure measurements from an array of current meter moorings deployed in the vicinity of the OTEC-1 site, salinity and temperature profiles collected at 17 stations of the OTEC-1 platform, velocity profiles collected at 4 stations during a cruise in August 1980, and temperature profiles from 21 casts of expendable bathythermographs in the area between the OTEC-1 platform and the south coast of Maui. (ERA citation 07:049813)

DE82016006 MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Dish Concentrators for Solar Thermal Energy: Status and Technology Development.
L. D. Jaffe. 1 Jan 82, 66p DOE/JPL-1060-48, JPL-PUB-81-43
Contract AT04-81AL16228
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A wide variety of point-focusing concentrators are under consideration for solar thermal energy use. They are reviewed briefly in this paper. These concentrators differ in such characteristics as optical configuration, optical materials, structure for support of the optical elements and of the receiver, mount, foundation, drive, and controls. Point-focusing concentrators need good optical efficiency and, especially for high-temperature applications, high geometric concentration ratio. Most important for the future, however, is low installed cost and low lifetime cost. Critical cost contributors for quantity production are the cost of materials and the cost of installation labor. Technology development for concentrators is needed in such areas as optical materials, establishment of design wind speeds and wind loads (including array interactions), structural configurations, stability of structural polymeric and forest-product materials during environmental exposure, and cleaning and maintenance of optical surfaces. Especially needed is field testing of complete collectors, i.e., concentrators with receivers and controls. (ERA citation 07:043042)

DE82750454 PC **A08**/MF **A01**
Stuttgart Univ. (Germany, F.R.). Inst. fuer Kernenergetik und Energiesysteme.
Comparative and Evaluating Analysis of Selected Energy Studies.
H. Majer, G. Ruehle, and E. Thoene. Feb 78, 157p IKE-K-54-8
In German.
U.S. Sales Only.

Energy problems are long-term problems. Consequently the decisive authorities of energy policy shall have to provide measures which are able to contribute to solving the energy problem. These measures require prognoses on the presumable development of energetic, economic, and social factors. There is no want of such prognoses. As, however, the results frequently do not agree with each other, it seems necessary to find out the starting positions, assumptions, and results of several studies, to compare and to critically assess them. This is the target of the present expert's report which is to contribute to the transparency of the energy policy debate. (ERA citation 07:050598)

DE82900717 MF **A01**
Bioteknisk Inst., Kolding (Denmark).
Reduction of Energy Consumption in Grain Drying. Vol. 2. Investigations in an Experimental Drying Plant.
E. E. Jacobsen, and S. N. Mogensen. May 80, 38p NP-2900717
In Danish.Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The major part of the grain harvested in Denmark has to be dried about 3-4%. As the drying process consumes about 5 Kg petroleum per 1 ton grain, new drying plants are being developed to cut energy losses. Experimental units with new aeration systems, temperature regulation, and various drying periods are discussed. Gas burners were successfully applied in the experimental grain dryers. (ERA citation 07:044061)

DE82900718 MF **A01**
Uppsala Univ. (Sweden). Meteorologiska Institutionen.
Gotland-Skaane PIBAL Project for WECS Siting. Pt. A: Measurements.
T. Faxen. 1980, 197p UUIM-62
Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This report describes the extensive field measurement campaign for Wind Energy Conversion System siting carried out on the island Gotland and in the province of Skaane in Sweden in the fall of 1978. The purpose with the project and the measurement methods are described but the emphasis is put on a complete description of all the collected data. The data set mainly consists of wind data from simultaneous double theodolite pilot balloon trackings at a number of sites, five on Gotland and four in Skaane. Totally 4 campaigns were performed in Skaane and 3 on Gotland, each campaign covering 2-3 days. Each day and at each place about 15-30 balloons were released and followed up to about 1000 m. All these data together with some standard meteorological observations are given together with a full description of the different measurement sites. (ERA citation 07:043186)

DE82900719 MF **A01**
Bioteknisk Inst., Kolding (Denmark).
Energy Conservation in Cereals Drying - a Progress Report. Investigations of Industrial Drying Plants - Preheating of Cereals.
F. Schmidt, E. E. Jacobsen, and S. N. Mogensen. 1981, 46p NP-2900719
In Danish.Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Two different traverse-system drying plants were studied and tests were accomplished with drying of preheated grain in an experimental dryer. The types used were industrial dryers of Monsun type from Lachenmeier Machine Factory and Cimbria from Cimbrian Unigrain Ltd. The results from Monsun proved the grain to be more dry on the air-exhausting side and to vary in water concentration in horizontal plane. Results from Cimbria proved the grain to be more dry on the air-inblowing side. The drying was not wellmixed, the temperatures measured varied from max. 100 deg C to min. 84 deg C. Preheating of grain improves the drying capacity of the system. No essential improvement of specific energy consumption was achieved by means of preheating. (ERA citation 07:044062)

DE82902365 PC **A02**/MF **A01**
Bundesministerium fuer Forschung und Technologie, Bonn-Bad Godesberg (Germany, F.R.).
Analysis of the Amount of Energy and Materials Used in the Packings of Liquid Nourishment and Luxuries. Vol. 6. Analysis of Specific Energies for Transportation of Some Packing Materials.
J. Vogelsang. 1981, 14p BMFT-FB-T-81-064
In German.
U.S. Sales Only.

Part 6 of the above project deals with analysis of specific energies for transportation of some packing materials. Specific transport energies for glass bottles and tin boxes and paper bags for beverages are discussed. (ERA citation 07:044033)

DE82903074 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
Energy Balance Sheets: Methodological Considerations.
A. Pecchio. Dec 80, 61p CNEN-RT/EC-(80)3
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

The structure and objectives of energy balance sheets are examined, stressing their importance for energy forecasts. Specifically, the following problems are analyzed: data availability, surveyable energy sources, different energy sources aggregation, and possible measurement units. Focus is on global energy balance sheets. (ERA citation 07:047036)

DE82903277 MF **A01**
Data Resources, Inc., Lexington, MA.
Residential Demand for Energy. Volume 1: Residential Energy Demand in the United States. Final Report.
L. D. Taylor, G. R. Blattenberger, and R. K. Rennhack. Apr 82, 180p EPRI-EA-1572-V.1
Available in microfiche only.

Updated and improved versions of the residential energy demand models that are currently used in EPRI's Demand 80/81 Model are presented. The primary objective of the study is the development and estimation of econometric demand models that take into account in a theoretically appropriate way the problems caused by decreasing-block pricing in the sale of electricity and natural gas. An ancillary objective is to

take into account the impact on electricity, natural gas, and fuel oil demands of differences and changes in the availability of natural gas. Econometric models of residential demand are estimated for all three fuel types using time-series data by state. Price and income elasticities for a number of alternative models are presented.

DE82903481 MF **A01**
Energie-Versorgung Schwaben A.G., Stuttgart (Germany, F.R.).
Heat from the Sun.
W. von der Sonne. 1979, 12p NP-2903481
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This is a popular information brochure of Energieversorgung Schwaben AG, in which the fundamentals of solar energy utilization are presented. (ERA citation 07:042990)

DE82903897 PC **A04**/MF **A01**
Arkansas Univ., Fayetteville. Dept. of Mechanical Engineering.
Solar Radiation for the State of Arkansas. Final Report.
W. D. Turner, and I. H. Battle, Jr. 15 Sep 80, 74p NP-2903897

After brief reviews of the nature of solar radiation, pyrheliometers and pyranometers, and the geometric relationship between the sun and the earth, information is given for the state of Arkansas on the amount of solar energy that is typically available for each month of the year as well as for a complete year. The insolation is given in terms of direct or beam insolation and total insolation for a variety of surface orientations that most frequently enter into the design processes for architectural and engineering systems. Also explained are methods on how to evaluate the beam and total tilt factors for various surfaces and to estimate the diffuse-to-total radiation split. Regression models are discussed for evaluating total horizontal and direct normal radiation for the state of Arkansas.

DE82904021 MF **A01**
Old West Regional Commission, Billings, MT.
Mitigating the Impacts of Coal/Energy Development in the Western States.
1980, 141p NP-2904021
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A hypothetical case study was presented at the workshop involving a western county, a typical town, and an unincorporated area in the county. The county was to be affected by the construction of a coal-fired generating plant and the opening of a strip mine. Participants examined the growth implications, potential problems, and possible solutions. Specific problems associated with water supply, waste treatment, roads, schools, solid waste disposal and public safety were addressed. In a role playing situation, participants moved through 12 years of growth and development. Land development and public investment decisions were made. This report contains the manual for instruction to participants. The chapter titles include: The Challenge; Dealing with earth science and environmental factors; Developing a fiscal management plan; Assistance from public and private sectors; Impact mitigation simulation; and List of participants. (ERA citation 07:042171)

N82-29676/5 PC **A04**/MF **A01**
California Univ., Santa Barbara. Dept. of Geography.
Relation of Land Use/Land Cover to Resource Demands.
C. Clayton. Mar 81, 52p NASA-CR-166369
Contract NAG2-20

Predictive models for forecasting residential energy demand are investigated. The models are examined in the context of implementation through manipulation of geographic information systems containing land use/cover information. Remotely sensed data is examined as a possible component in this process.

N82-29712/8 PC **A02**/MF **A01**
Regensburg Univ. (Germany, F.R.).
Wind Turbine Value Analysis for Electric Utilities.
W. Dub. Jun 82, 20p
Sponsored by International Energy Agency.

A methodology for the analysis of the value of large-scale wind turbines to electric utilities, and its application to utility, socioeconomic and meteorological data in two case studies is described. The value analysis was carried out for the year of reference 1985 and included different levels of wind turbine penetration. Results of the value analysis are given. The utility planning procedures in current use and the unique problems of the integration of wind power into the power system are discussed. Observations and conclusions regarding the current and future potential of wind power for utilities are presented.

N82-29715/1 PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Retrofit Energy Conservation in Residential Buildings in Southern California.
R. H. Turner, G. C. Birur, and C. Daksla. 15 Jun 82, 43p NASA-CR-169137, JPL-PUBL-82-55
Sponsored by NASA and Southern California Edison CO.

The common energy conservation techniques (ECTs) that can be retrofit-installed into residential buildings are surveyed. The quantity of saved energy for heating and cooling attributable to each ECT is evaluated for three common modes of heating: natural gas heating at 60/therm; heating via heat pump at $1.20/therm; and electric resistance heating at $2.40/therm. In every case, a life cycle cost comparison is made between the long term revenue due to energy conservation and a safe and conventional alternative investment that might be available to the prudent homeowner. The comparison between investment in an ECT and the alternative investment is brought into perspective using the life cycle payback period and an economic Figure of Merit (FOM). The FOM allows for relative ranking between candidate ECTs. Because the entire spectrum of winter heating climates in California is surveyed, the decision maker can determine whether or not a considered ECT is recommended in a given climate, and under what conditions an ECT investment becomes attractive.

N82-29767/2 PC **A05**/MF **A01**
Teknologisk Inst., Tastrup (Denmark).
Durability of Solar Collectors. Experience of Solar Collectors Exposed to Natural Weather Conditions in a Controlled Simulated Operation During 3 Years on Testing Stand.
T. V. Hansen, G. Madsen, and E. Mikkelsen. Jul 80, 86p DE82-900723, NP-2900723
Text in Danish.

Durability of several types of solar collectors after 3 years exposure was tested on an experimental testing stand with solar simulators. The collectors' resistance to corrosion in normal weathering conditions (snow, wind, rain) was tested; untightness of seals, changes in plastic foils, and glass recrystallisation are discussed. Recommendations are given on how to minimize the corrosive effects and choose the most suitable types and materials certified for outdoor durable exposure for villa-size solar heating systems.

PB82-261942 PC **A06**/MF **A01**
Puerto Rico Administration of Regulations and Permits, Santurce.
Codigo para la Conservacion de Energia en Edificios en Puerto Rico (Code for Energy Conservation in Buildings in Puerto Rico).
1979, 108p
Text in Spanish.

Energy conservation is part of a comprehensive energy program for Puerto Rico. The Puerto Rican Office of Energy has recently concentrated on developing a balanced energy conservation plan, emphasizing the adaptation of building construction to reduce the amount of energy used for lighting, air conditioning, and power in general, while also attempting to identify opportunities for maximum heating efficiency. The building construction program involves establishing lighting and heating efficiency standards to be implemented by the Administration of Regulations and Permits through the adoption of a building regulations supplement (Planning Regulations No. 7), which will be known as the 'Code for Energy Conservation in Buildings in Puerto Rico'. The code, developed under the auspices of the Puerto Rican Office of Energy with funds provided by the U.S. Department of Energy and with the participation of those government agencies that must comply with public energy conservation policy in Puerto Rico, includes general provisions, design criteria and conditions, technical standards, etc. The technical provisions of Standard 90-75 and proposed revisions 90-75R of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), criteria of the Federal Energy Administration and Federal General Services Administration, and the provisions of the current Model Energy Code in the United States were considered in preparing the code.

PB82-262809 PC **A16**/MF **A01**
Exeter Associates, Inc., Bethesda, MD.
Projected Electric Power Demands for the Allegheny Power System,
Matthew Kahal. Apr 82, 358p PPSP/PPES-2-82
See also PB81-188112.

This report presents a set of forecasts of electric power demands for the Allegheny Power System and each of its principal operting subsidiaries--The Monogahela Power Company, The West Penn Power Company and The Potomac Edison Company. It contains both the original forecast study performed in 1979 and an update completed in November 1981. Forecasts are based upon a series of econometric equations of energy and peak demand. Residential energy usage is explained by population, real income, electricity prices and weather, while commerical and industrial power demands are explained mainly by electricity prices, natural gas prices, manufacturing activity, employment and wage rates. Price elasticities vary by state and by company but average approximately -0.5 (long run).

PB82-264078 Not available NTIS
National Bureau of Standards, Washington, DC.
Development of Equipment Seasonal Performance Models for Simplified Energy Analysis Methods.
Final rept.,
Tamami Kusuda, Taghi Alereza, and Leonard Hovander. 1982, 13p
Prepared in cooperation with Department of Energy, Washington, DC.
Pub. in American Society of Heating, Refrigerating and Air-Conditioning Engineers Transactions Paper No. 2715, 82, Pt. 2, 13p 1982.

In pursuit of development of simplified energy calculation methodologies, seasonal performance models for residential heating and cooling systems were developed. Previous studies have shown that the variable-base degree-day (VBDD) method renders results close to those generated by hourly models, such as DOE-2. However, the results included only heating and cooling loads, not the energy use. The objective of this research was to develop a method for calculation of seasonal performance of residential HVAC equipment while it could be used within the framework of variable-base degree-day method. Using the results of DOE-2 on 60 residences representing 10 climatological conditions, seasonal performance models were developed for gas and oil furnaces, air conditioners, and heat pumps. These models utilize the heating and cooling loads calculated by VBDD, equipment specifications, and weather information, to calculate the seasonal efficiencies COP's for residential HVAC equipment. Results obtained using these seasonal models were mainly within 5 percent of those calculated hourly by DOE-2.

PB82-264250 Not available NTIS
National Bureau of Standards, Washington, DC.
Fire Testing of Solar Collectors by ASTM E 108.
Final rept.,
David Waksman, and William D. Walton. May 82, 14p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Fire Technology 18, n2 p174-187 May 82.

A study was undertaken to investigate the use of ASTM E 108 (NFPA 256, UL 790), Fire Tests of Roof Coverings, for testing roof-mounted solar energy collectors. The collectors were tested with three types of mountings: integrally as the roof, directly on the roof covering, and on standoffs above the roof covering. Data are presented showing the results of the testing conducted. An evaluation of the testing procedures as they apply to roof-mounted solar collectors is given.

PB82-266388 PC **A18**/MF **A01**
Bharat Heavy Electricals Ltd., Hyderabad (India). Corporate R and D Div.
Proceedings of National Heat and Mass Transfer Conference (5th) Held at Hyderabad on February 13-16, 1980. Volume I.
Feb 80, 418p
See also Volume 2, PB82-266396.

This Volume contains 53 of the 92 papers presented during the seven technical sessions. The remaining 39 papers are covered in Volume II. The main topics covered are: Power Plant Heat Exchangers and Electrical Machines; Two-Phase Flow Systems; Basic Heat and Mass Transfer; Nuclear System; Non-Conventional Energy Systems; Experimental Heat and Mass Transfer; and Numerical Methods in Heat and Mass Transfer.

PB82-266396 PC **A14**/MF **A01**
Bharat Heavy Electricals Ltd., Hyderabad (India). Corporate R and D Div.
Proceedings of National Heat and Mass Transfer Conference (5th) Held at Hyderabad on February 13-16, 1980. Volume 2.
Feb 80, 314p
See also Volume 1, PB82-266388, and Volume 3, PB82-266404.

This volume contains 39 of the 92 papers presented during the seven technical sessions. The first 53 papers are covered in Volume I. The papers are grouped under seven main headings, namely, Power Plant Heat Exchangers and Electrical Machines; Two-Phase Flow Systems; Basic Heat and Mass Transfer; Nuclear Systems; Non-Conventional Energy Systems; Experimental Heat and Mass Transfer; and Numerical Methods in Heat and Mass Transfer.

PB82-266404 PC **A11**/MF **A01**
Bharat Heavy Electricals Ltd., Hyderabad (India). Corporate R and D Div.
Proceedings of National Head and Mass Transfer Conference (5th) Held at Hyderabad on February 13-16, 1980.
Feb 80, 230p
See also Volume 2, PB82-266396.

A total of 92 papers were presented at the conference which are covered in Volumes I & II. This Volume contains 6 invited lectures and discussions on the various papers presented in the six technical sessions. The topics covered in 6 invited lectures were: Recent Advances in Analytical Methods in Applied Heat Transfer; Natural Convection on Heat Transfer from Rectangular Fin Arrays; Solar Energy and its Heating Aspects; A Surface Renewal Model for Short-Lived Transfer Processes; Analytical and Experimental Investigations of the Flow Distribution Inside a U-Tube Steam Generator; and An Assessment of Current LWR Thermal-Hydraulic Safety Concerns.

PB82-266883 PC **A06**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd. Volume 29, No. 2, 1979.
1979, 115p
Text in Japanese and English, abstract in English. Also pub. in ISSN-0004-4210.

Document contains articles on the following subjects: Thermal Balance Through Window During Heating Season in a Single-Family Residence (Text in Japanese); Energy Use and Economic Analysis of Window in Office Building (Text is Japanese); Properties of Choresteric-Nematic Phase Change Type Guest-Host Liquid Crystal Display Device (Text in Japanese); Synthesis and Thermal Property Measurements of Cordierite Ceramics (Text in Japanese); Preparation of Perfluoro-r-butyrolactone (Text in English); Catalytic Combustion of Methyl Bromide (Text in Japanese); Aromatic Polymers Containing Imide Linkage (Text in English).

PB82-871500 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Geothermal Power: Conversion Systems and Equipment. 1977-September, 1982 (Citations from the Energy Data Base).
Rept. for 1977-Sep 82.
Sep 82, 254p
Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the design, testing, and operation of geothermal conversion systems and equipment. System design and operations cover both conceptual design and detailed design of actual operating geothermal power plants. Equipment includes turbines, heat exchangers, condensers, and piping. Some of the articles cover working fluid thermodynamics. (Contains 259 citations fully indexed and including a title list.)

PB82-875766 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Puerto Rico: Energy and Environment. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 269p
Supersedes PB81-855934.

This bibliography contains citations concerning energy policies, sources, supplies, and technology in Puerto Rico. Environmental impacts and protection from energy and industrial activities, waste disposal and other sources are considered. (This updated bibliography contains 213 citations, 63 of which are new entries to the previous edition.)

PB82-876285 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Resource Conservation and Recovery Act (RCRA). 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 210p
Supersedes PB81-851024.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the resource conservation and recovery act (RCRA). Impacts of this act upon various energy production processes and systems and upon the industries which use or market them are considered as well as the rules and regulations for the recovery of wastes and their utilization in energy production. (This updated bibliography contains 190 citations, 106 of which are new entries to the previous edition.)

PB82-876376 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Small Wind Energy Conversion Systems (SWECS). 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 120p
Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the technology, design, and performance of small wind energy conversion systems (SWECS). Tower dynamics and rotor/wind dynamic interactions are considered. Federal and state regulations, economic analyses, and marketing are discussed. Safety and reliability are also discussed. (Contains 125 citations fully indexed and including a title list.)

10B. Power Sources

DE82007784 MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Residential Photovoltaic-System Simulation: Thermal Aspects.
G. W. Hart, and P. Raghuraman. 1982, 9p DOE/ET/20279-183, CONF-820410-7
Contract AC02-76ET20279
ASME solar energy conference, Albuquerque, NM, USA, 26 Apr 1982, Portions of document are illegible. Best available copy from document source. Available in microfiche only.

A TRNSYS simulation has been developed to simulate the performance of utility-interactive residential photovoltaic energy systems. The PV system is divided into its major functional components, which are individually described with computer models. These models are described in detail. The results of simulation and actual measured data obtained at MIT Lincoln Laboratory's Northeast Residential Experiment Station are compared. The thermal influences on the design of such photovoltaic energy systems are given particular attention.

DE82008086 PC **A06**/MF **A01**
Argonne National Lab., IL.
Five OTEC Biofouling and Corrosion Experiments at Keahole Point, 1976 to 1980.
F. C. Munchmeyer, L. R. Berger, and B. E. Liebert.
Nov 81, 122p ANL/OTEC-BCM-026
Contract W-31-109-ENG-38
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Five groups of experiments are summarized which were conducted on simulated OTEC heat exchangers at Keahole Point, Hawaii in order to evaluate the effects of biological fouling and corrosion on the seawater side of a heat exchanger tube. Sites and field apparatus, heat transfer, water quality, biology and corrosion aspects of the OTEC experiments are discussed. Six candidate tube materials were exposed during the experiments and preliminary answers to corrosion questions were found. Two results are, first, that 5052 aluminum tubes did not pit, and second, that their rate of corrosion was slow enough to suggest a 30-year design life when the tubes are cleaned with a bristle brush.

DE82008275 MF **A01**
AiResearch Mfg. Co. of Arizona, Phoenix.
Brayton Isotope Power System. Volume II. System Evaluation Attributes.
15 Mar 78, 273p DOE/SF/01123-T61
Contract AC03-76SF01123
Portions of document are illegible.
Available in microfiche only.

This volume of the Brayton Isotope Power System, Phase II Plan, contains the self-evaluation by AiResearch, GE, and TECO, addressing Section 3 of The Dynamic Systems Evaluation Criteria and Procedures established by the Department of Energy. These evaluation criteria addresses: Component Feasibility; Flight System Design Performance; GDS Test Results; Reliability and Practicality; Safety; Spacecraft Integration; and Cost and Risk. Included in each of these general categories are several attributes, each of which addresses a separate component, feature, or area of interest related to the power system, its development status, degree of preparedness for proceeding into a flight program, and/or the contractors' performance during Phase I. The key elements which indicate the readiness of a radioisotope power system to progress into a flight qualification program are: an advanced state of development of the power conversion system; demonstrated or exhibited potential for space systems standards of reliability; evident capability of meeting system safety requirements; favorable cost/benefit tradeoff considering projected missions and technology advancement potential; and proven feasibility of fabricating and qualifying a flight system and integrating it with a candidate spacecraft and launch vehicle. As a result of considerable government investment in Brayton system component development, the MHW isotope heat source and the BIPS Phase I Ground Demonstration System, the BIPS is a more advanced state of development than any previous radioisotope power system technology. Evidence of this is presented along with a complete review of the attributes, the contractor recommended ratings, and the rationale for the self-evaluation.

DE82008294 PC **A03**/MF **A01**
Hittman Associates, Inc., Columbia, MD.
On-Site Solar-Thermal Electric Power Generation.
H. M. Curran. May 81, 32p H-C-1007/010-81-1027
Contract AC03-79CS30202

Some aspects of using on-site solar power generation for buildings are studied, particularly in relation to Rankine/vapor compression cooling. On the basis of the results of the various studies, computer models, and project reports examined, one is led to the conclusion that for on-site power generation systems interfaced with electric utilities, dedicated storage is not required, and in most instances would not be cost-effective. For solar Rankine cooling systems, in particular, the inclusion of a power generation capability interfaced with an electric utility could improve the cost effectiveness of such systems, by reducing the first cost through elimination of storage, and by increasing the solar collector utilization factor. Computer studies of various system configurations and penetration levels in various utility service areas are recommended, followed by experimental testing of the most promising systems identified by such studies.

DE82008542 MF **A01**
Bechtel Group, Inc., San Francisco, CA.

Conceptual Design of a Solar Cogeneration Facility at Pioneer Mill Co., Ltd.
Apr 81, 159p DOE/SF/11432-T1
Contract AC03-80SF11432
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Results are reported of a conceptual design study of the retrofit of a solar central receiver system to an existing cogeneration facility at a Hawaii raw sugar factory. Background information on the site, the existing facility, and the project organization is given. Then the results are presented o the work to select the site specific configuration, including the working fluid, receiver concept, heliostat field site, and the determination of the solar facility size and of the role of thermal storage. The system selected would use water-steam as its working fluid in a twin-cavity receiver collecting sunlight from 41,420 m exp 2 of heliostat mirrors. The lates version of the system specification is appended, as are descriptions of work to measure site insolation and a site insolation mathematical model and interface data for the local utility.

DE82008715 PC **A05**/MF **A01**
Argonne National Lab., IL.
Ampel Experiments: Seed and Slag Deposit Tests for an MHD/Steam Bottoming Plant.
B. J. Schlenger, L. S. H. Chow, C. B. Reed, P. F. Dunn, and T. R. Johnson. Dec 81, 86p ANL/MHD-81-14
Contract W-31-109-ENG-38
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The results of four seed condenser tests conducted at the Argonne MHD Process Engineering Laboratory (AMPEL) are described. The purpose of these tests was to determine the effects of seed and slag deposits on the heat transfer performances of the steam superheaters and reheaters in the MHD steam bottoming plants. To simulate conditions downstream of the MHD power train, a slurry of No. 2 fuel oil, potassium sulfate, an Montana Rosebud fly ash was injected into the 2-MW combustor, and burned with preheated air. The four tests were run under similar combustion gas compositions, but at different gas temperatures within the tube bank. The physical structure, chemical content, thickness and density of the tube deposits from each test are compared. The gas-side heat transfer coefficient and effective seed-slag thermal conductivity of the deposits are presented also. From these results, it was inferred that at high gas temperatures (> 1600 K) convective tube banks could operate efficiently and continuously without mechanical removal of the seedash deposits, and at intermediate temperatures (1600 to 1400 K), tube banks with wide transverse spacing could operate continuously. Conventional deposit removal techniques were successful in removing seed-ash deposits.

DE82009320 PC **A09**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Photovoltaic off-Farm Agricultural Applications: Final Report. Volume II. Technical Report.
W. F. Adolfson. Feb 82, 200p SAND-81-7175-V.2
Contract AC04-76DP00789
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The off-farm agricultural industry, which includes food processing, agricultural chemicals, tobacco and alcohol fuels, consumes about 2 percent of the United States energy supply for direct heat and mechanical power. Photovoltaic energy systems can cut energy costs in many of these industrial applications, although early utilization may be inhibited by certain market barriers. Five candidate conceptual designs available for supplementing the energy required by off-farm agricultural applications are highlighted. Illustrations and parametric cost analyses are provided to assist energy managers in assessing the options and selecting designs for retrofit of existing systems or incorporation of new installations. (ERA citation 07:042895)

DE82011517 PC **A15**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Commercial/Industrial Photovoltaic Module and Array Requirement Study. Final Report.
T. Hood, J. Thompson, and D. Zaremski, Jr. Dec 81, 345p DOE/JPL/955698-81/1
Contract NAS-7-100-955698
Portions of document are illegible.
Microfiche only after original copies are exhausted.

A study has been conducted to identify design requirements for photovoltaic modules and arrays used in commercial and industrial applications. Building codes and referenced standards were reviewed for their applicability to commercial and industrial photovoltaic array installation. Four general installation types were identified: integral (replaces roofing), direct (mounted on top of roofing), stand-off (mounted away from roofing), and rack (for flat or low slope roofs, or ground mounted). Each of the generic mounting types can be used in vertical wall mounting systems. This implies eight mounting types exist in the commercial/industrial sector. Installation costs were developed for these mounting types as a function of panel/module size. Cost drivers were identified. Studies were performed to identify optimum module shapes and sizes and operating voltage cost drivers. The general conclusion is that there are no perceived major obstacles to the use of photovoltaic modules in commercial/industrial arrays. However, there is no applicable building code category for photovoltaic modules and arrays and early additional work is needed with standards writing organizations to develop commercial module and array requirements. As some obstacles could make PV extremely costly, recommendations are made to the PV industry which will facilitate a more successful product entrance into the building industry.

DE82011557 MF **A01**
Brookhaven National Lab., Upton, NY.
Solid-Electrolyte Fuel Cells.
H. S. Isaacs. 1981, 29p BNL-30840, CONF-811148-2
Contract AC02-76CH00016
Conference on IGT fuel cells technology status and applications, Chicago, IL, USA, 16 Nov 1981, Portions of document are illegible.
Available in microfiche only.

Potential advantages of solid electrolyte over other fuel cells are: (1) higher projected efficiencies; (2) higher attainable current densities; (3) recycling the CO sub 2 stream from anode to cathode and water control is unnecessary; (4) no cell corrosion problems; and (5) stable electrolytes. Brown, Boveri and Cie have operated a single cell for over 50,000 h and a multi-cell stack for over 10,000 h. A Westinghouse multi-cell stack (up to 20 cells) was designed, fabricated, and tested for over 700 h. The operating cell characteristics (200 mA cm exp -2 at 0.7 V) are encouraging with respect to meeting power plant performance goals. Solid electrolyte fuel cell power plants appear promising for large-scale power generation after the year 1990 with application of cogeneration of electricity and heat for either aluminum production and steam/turbine electricity applications. 31 references.

DE82011687 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
High-Aspect-Ratio Silicon-Cell Metallization Technical Status Report. Final Report.
Jan 82, 43p SAND-81-7033
Contract AC04-76DP00789
Portions of document are illegible.
Microfiche only after original copies are exhausted.

Two features of the silicon concentrator solar cell are addressed which affect output at high concentration levels. The first is the development of narrow but high electroplated grid lines with improved conductivity. The object is a reduction in cell series resistance without increase in shadowing. This goal is accomplished by electroplating through a thick photo resist mask to produce lines .7 mil wide by .7 mil high. Advance pulse plating techniques are combined with pure silver plating baths to produce a deposit conductivity equal to the bulk silver conductivity (a 1.5 to 2 X improvement over conventional silver plating). The second feature is a double diffused selectively textured front surface. This development employs a deep diffusion in the silicon under the grid lines. Only the non grid line open area is selectively texture etched removing the deep junction. This open textured area is then given a second shallow diffusion for optimum cell efficiency. This selective procedure maintains the original highly polished wafer surface under the grid lines so that high resolution narrow grid lines are possible. The double diffusion protects the junction from metal diffusion while enabling the optimum shallow junction in the illuminated regions. Combining these two features has produced a large area concentrator cells (8 cm exp 2) with peak efficiency above 16% and exhibiting a broad peak efficiency extending from 50 to 175 suns above 15%.

DE82013398 PC **A03**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Assessment of Deposition for Power-Plant Molten-Carbonate Fuel Cells.
R. A. Wenglarz. 15 Mar 82, 28p DOE/RL/00600-T2
Contract AM06-77RL00600

Particulate deposition in molten carbonate fuel cell anodes is addressed for operation with future coal gasification power plants. Power plant systems factors affecting deposition are explored such as gas cleanup requirements for particulate removal and gasifier product gas composition differences for various gasifier types and operational modes (air blown versus oxygen blown). Effects of fuel cell characteristics (including average cell current density and fuel utilization) on anode deposition are also quantified. Particulate effects on molten carbonate fuel cell anode performance may not be as detrimental as perhaps perceived in the past. Gas cleanup to remove virtually all particles larger than one micron in diameter is expected to prevent or at least greatly reduce anode deposition. However, cathode deposition in molten carbonate fuel cells should be evaluated in the future since cathodes are likely more prone to deposition than anodes even though cathode channel particle concentrations are much lower. (ERA citation 07:047151)

DE82013431 PC **A03**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Mechanisms Affecting Mass Transfer in Fuel Cells.
R. A. Wenglarz. 15 Mar 82, 27p DOE/RL/00600-T1
Contract AM06-77RL00600

An initial analysis of particulate effects on molten carbonate fuel cells has been conducted. The analysis has been applied to a conceptual fuel cell with operating parameters appropriate to use with future power generation plants. Particle transport due to several mechanisms has been considered and dominant mechanisms affecting particle delivery to anode channel surfaces and into anode pores have been identified. Thermophoresis and gas flow out from anode pores have been found to inhibit particle arrival on the anode and entry into pores so that neither anode channel blockage nor pore blockage are expected for particles with diameters smaller than about one micron. The analytical approach developed could be applied to other fuel cell types in addition to the molten carbonate fuel cells.

DE82013502 PC **A04**/MF **A01**
Department of Energy, Washington, DC. Energy Information Administration.
Cost and Quality of Fuels for Electric Utility Plants.
Dec 81, 72p DOE/EIA-0075(81/12)

Tabulated data are presented on coal, fuel oil, and gas consumption at US steam-electric power plants and at peaking power plants. The information is tabulated by month of the year, geographic region, state, and type of fuel. Additional data are supplied on the quantity, cost, and average percent of sulfur for fuels used by named utilities in each state. (ERA citation 07:043870)

DE82014094 PC **A07**/MF **A01**
J-U-B Engineers, Inc., Twin Falls, ID.
Feasibility Study for the City of Twin Falls Sewage Hydroelectric Project in Twin Falls County, Idaho.
Aug 81, 134p DOE/ID/40035-T1
Contract FM07-81ID40035
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The City of Twin Falls, Idaho authorized J-U-B Engineers, Inc., to assess the feasibility of installing a small hydropower plant on the discharge of the City's Grandview sewage trunk line. The concept of developing hydropower from sewage flow is novel and may have applications in other areas of the nation if its technical feasibility can be established. No conventional turbine would be suitable in this application without extensively screening the influent. Therefore, finding a turbine which would work satisfactorily, was one of the major aspects of the study. A solution to this problem was found in a staged, non-clog, hydraulic turbine manufactured by Cornell Pump Co. A preliminary design configuration is presented using these turbines. The economical feasibility of the project depends on future

sewage flows from Idaho Frozen Foods Company, a large contributor to the present Twin Falls sewage flows. The yearly revenue, would decrease by about one-third, if Idaho Frozen Foods disconnects from the City's sewage system. Therefore, the project is less feasible, economically, without the flow contributed by Idaho Frozen Foods. The cost of energy production is 47 mils per kilowatt-hour (kWh) with this flow, and about 60 mils/kWh without this flow. At the higher flow rate (5 cfs) the total capital investment is estimated to be $270,200 or approximately $2250 per installed kW capacity. Estimated annual energy production at 5.0 cfs is 440,650 kWh with a subsequent first year annual revenue of $59,460. Power could be put on line within nine months of the time the Twin Falls City Council makes a decision to develop the project.

DE82014247 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Intermediate Photovoltaic System Application Experiment Operational Performance Executive Summary. Volume 8, Newman Power Station, El Paso, TX.
Mar 82, 9p SAND-81-7100/8
Contract AC04-76DP00789
Microfiche only after original copies are exhausted.

Performance data are briefly summarized for the month of February 1982, for a 20 kWp photovoltaic flat panel power system for an uninterruptable power supply load (computer) at a Texas utility. Data given include: daily and monthly electrical energy produced; daily and monthly incident solar energy; array efficiency; capacity factor; and the data acquisition mode and recording interval plot. (ERA citation 07:042890)

DE82014712 MF **A01**
Solar Energy Research Inst., Golden, CO.
Photoelectronic Properties of Zinc Phosphide Crystals, Films, and Heterojunctions. Quarterly Progress Report No. 12, January 1-March 31, 1982.
R. H. Bube, F. C. Wang, and S. Casey. 1982, 21p
SERI/PR-1202-1-T4
Contract AC02-77CH00178
Best available copy from document source. Available in microfiche only.

Antiphase domain boundaries and low-angle grain boundaries formed from pile up of dislocations are the two commonly observed defects in sublimation-grown Zn sub 3 P sub 2 crystals by TEM. Except for these two types of defect, the crystals were of good quality and defect free. CdS/Zn sub 3 P sub 2 heterojunctions were prepared by vacuum evaporation deposition of CdS films onto single crystal Zn sub 3 P sub 2 . The cells were poor diodes, showing V/sub oc/ of less than 0.1 V even with J/sub sc/ = 8.3 mA/cm exp 2 . A heat treatment at 450 exp 0 C for 10 min in hydrogen increased V/sub oc/ to 0.55 V, but only at the expense of virtually eliminating the J/sub sc/. CdS/Mg/Zn sub 3 P sub 2 heterojunctions have been prepared with a 50 to 100A Mg film being vacuum deposited on single crystal Zn sub 3 P sub 2 , followed immediately by vacuum deposition of a CdS film without breaking vacuum. The CdS film acts to passivate the thin Mg film, serves as front contact, and acts as an anti-reflection coating. The best cell prepared in this way showed V/sub oc/ = 0.50 V, J/sub sc/ = 7.6 mA/cm exp 2 and ff = 0.45. Other cells with smaller V/sub oc/ showed J/sub sc/ as high as 11.4 mA/cm exp 2 . Analysis of the collection function indicates an interface recombination velocity of 1.9 x 10 exp 7 cm/sec, the same as reported for ZnO/Zn sub 3 P sub 2 heterojunctions. Application of usual junction theory to calculation of the fill factor indicated that the measured values in the range of 0.4 to 0.5 were consistent with observed series and shunt resistance values and the collection function values. From all data to date it seems evident that interface properties of Zn sub 3 P sub 2 are unusually deleterious for junction formation, and that only Mg to date has been successful in reacting with the surface to form a good junction. Investigation of the interface interactions of Zn sub 3 P sub 2 appears critical for further development.

DE82014915 PC **A06**/MF **A01**
Brookhaven National Lab., Upton, NY.
Evaluation of Flat-Plate Photovoltaic/Thermal Hybrid Systems for Solar-Energy Utilization.
J. W. Andrews. Jun 81, 108p BNL-51435
Contract AC02-76CH00016

The technical and economic attractiveness of combined photovoltaic/thermal (PV/T) solar energy collectors was evaluated. The study was limited to flat-plate collectors since concentrating photovoltaic collectors require active cooling and thus are inherently PV/T collectors, the only decision being whether to use the thermal energy or to dump it. It was also specified at the outset that reduction in required roof area was not to be used as an argument for combining the collection of thermal and electrical energy into one module. Three tests of economic viability were identified, all of which PV/T must pass if it is to be considered a promising alternative: PV/T must prove to be competitive with photovoltaic-only, thermal-only, and side-by-side photovoltaic-plus-thermal collectors and systems. These three tests were applied to systems using low-temperature (unglazed) collectors and to systems using medium-temperature (glazed) collectors in Los Angeles, New York, and Tampa. For photovoltaics, the 1986 DOE cost goals were assumed to have been realized, and for thermal energy collection two technologies were considered: a current technology based on metal and glass, and a future technology based on thin-film plastics. The study showed that for medium-temperature applications PV/T is not an attractive option in any of the locations studied. For low-temperature applications, PV/T appears to be marginally attractive.

DE82015143 PC **A03**/MF **A01**
Atomics International Div., Golden, CO. Rocky Flats Plant.
North Wind Power Company 2-Kilowatt High-Reliability Wind System. Phase I: Design and Analysis Executive Summary.
D. J. Mayer, and J. H. Norton, Jr. Jul 81, 27p RFP-3310/1
Contract AC04-76DP03533
Portions of document are illegible.
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The results of Phase I of a program to design a 2kw high reliability wind turbine for use in remote locations and harsh environments are presented. A predecessor of the proposed design was procured and tested in a wind tunnel and in the freestream to observe operational characteristics. An analytical procedure was developed for designing and modelling the proposed variable axis rotor control system (VARCS). This was then verified by extensive mobile testing of pre-prototype components. A new low speed three phase alternator with a Lundel type rotor was designed. Prototypes were fabricated and tested to refine calculation procedures and develop an effective alternator with appropriate characteristics. A solid state field switching regulator was designed and tested successfully. All necessary support elements were designed and engineered. A complete analysis of system reliability was conducted, including failure mode and effects analyses and reliability, maintenance and safety analyses. Cost estimates were made for a mature product in production rates of 1000 per year. Analysis and testing conducted throughout the first phase is included in this report. Final prototype fabrication and testing will be covered in a subsequent Phase II report.

DE82015215 PC **A10**/MF **A01**
Stanford Univ., CA. High Temperature Gasdynamics Lab.
System Study of an MHD/Gas Turbine Combined-Cycle Baseload Power Plant. HTGL Report No. 134.
K. D. Annen. Aug 81, 204p DOE/ET/15611-T3
Contract AC01-80ET15611
Portions of document are illegible.

The MHD/gas turbine combined-cycle system has been designed specifically for applications where the availability of cooling water is very limited. The base case systems which were studied consisted of an MHD plant with a gas turbine bottoming plant, and required no cooling water. The gas turbine plant uses only air as its working fluid and receives its energy input from the MHD exhaust gases by means of metal tube heat exchangers. In addition to the base case systems, vapor cycle variation systems were considered which included the addition of a vapor cycle bottoming plant to improve the thermal efficiency. These systems required a small amount of cooling water. The MHD/gas turbine systems were modeled with sufficient detail, using realistic component specifications and costs, so that the thermal and economic performance of the system could be accurately determined. Three cases of MHD/gas turbine systems were studied, with Case I being similar to an MHD/steam system so that a direct comparison of the performances could be made, with Case II being representative of a second generation MHD system, and with Case III considering oxygen enrichment for early commercial applications. The systems are nominally 800 MW/sub e/ to 1000 MW/sub e/ in size. The results show that the MHD/gas turbine system has very good thermal and economic performances while requiring either little or no cooling water. Compared to the MHD/steam system which has a cooling tower heat load of 720 MW, the Base Case I MHD/gas turbine system has a heat rate which is 13% higher and a cost of electricity which is only 7% higher while requiring no cooling water. Case II results show that an improved performance can be expected from second generation MHD/gas turbine systems. Case III results show that an oxygen enriched MHD/gas turbine system may be attractive for early commercial applications in dry regions of the country.

DE82016001 MF **A01**
Jet Propulsion Lab., Pasadena, CA.
FSA Field Test Annual Report, August 1980-August 1981.
P. Jaffe, R. W. Weaver, and R. E. Lee. 15 Dec 81, 44p DOE/JPL-1012-59
Contract AI01-76ET20356
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A complete restructuring of Flat-Plate Solar Array Project field-test activity was done during the past year; its major element was redirecting emphasis away from collecting endurance data and toward the early identification and analysis of fundamental module problems. To support this shift and to accommodate an expected reduction in resources: (1) the 12 Continental Remote Sites have been decommissioned; (2) testing has been consolidated into a five-site network consisting of the four Southern California sites and a new Florida site; (3) 16 kW of new state-of-the-art modules are being deployed at the five sites; (4) testing of the old modules is continuing at the Goldstone site but as a low-priority item; (5) the major thrust of the new emphasis - early problem detection - will be accomplished by array testing of modules at the JPL site; (6) additional new testing capabilities are being added to the JPL site, which will elevate its operations to those of a field test laboratory for the simulation and investigation of real-use problems and the development of improved testing techniques; (7) a new key instrument is being fabricated, a versatile battery-powered array data logger, which will permit in-field diagnoses of arrays as large as 40 amperes and 400 volts. Restructuring is progressing on schedule. A final set of failure and degradation data was obtained from the modules at the Southern California sites before they were relocated at Goldstone. The mean composite failure rate for all the modules (Blocks I, II and III) over the past five years is 2.0% per year. Considering the final two years only, the rate is 4.4%, suggesting a significant upward final two years only, the rate is 4.4%, suggesting a significant upward trend with age. (ERA citation 07:042786)

DE82016027 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Data Report for the Northeast Residential Experiment Station - December 1981.
M. C. Russell, P. Raghuraman, and P. C. Mahoney. Apr 82, 19p DOE/ET/20279-192
Contract AC02-76ET20279
Portions of document are illegible.
Microfiche only after original copies are exhausted.

One month of physical data obtained at the Northeast Residential Experiment Station in Concord, Massachusetts for state-of-the-art photovoltaic systems is presented. Included is a summary of meteorological information, electric energy used and produced, solar cell array and power conditioning unit data, and photovoltaic system-utility energy flow. The data are also tabulated hour-by-hour for an averaged day of the month, and a monthly load duration curve is given for each of the loads being monitored. Five prototype systems are under test, each consisting of a roof-mounted solar cell array, sized to meet at least 50% of the annual electrical demand of an energy-conserving house, and an enclosed structure to house the remainder of the system equipment, test instrumentation, and work space. The systems are grid-connected. Data are also provided for a full-sized photovoltaic residence in Carlisle, Massachusetts. The methods of data analysis and reduction are discussed.

DE82016271 PC **A06**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Food Science and Technology.

General Electric Final Report: Design and Fabrication of a Prototype System for Photovoltaic Residences in the Southwest.
E. M. Mehalick. Apr 82, 120p DOE/ET/20279-193
Contract AC02-76ET20279
Portions of document are illegible.
Microfiche only after original copies are exhausted.

A photovoltaic (PV) system has been designed and integrated into a residential home suitable for the Southwest region of the country. The house design is described as well as the PV sywtem design which incorporates a unique shingle PV module developd by General Electric Company. The system has been installed and is currently being testedby New Mexico Solar Energy Institute (NMSEI) on a prototype structure at the Southwest Residential Experiment Station is Las Cruces, New Mexico. The photovoltaic system is grid connected and is designed to meet both space conditioning requirements and all conventional electrical load requirements for an all-electric residence. A 6.7-kW-peak power rating photovoltaic array has been designed for the house. The 73.3 m exp 2 of exposed solar array module area uses 375 direct-mounted shingle modules in a 25 series by 15 parallel network. The photovoltaic generated power is supplied to an Abacus 6-kW-output-rated dual-bridge inverter, which is controlled to approximately track the solar array maximum-powr operating point through an open-loop pilot-cell algorithm. The inverter feeds the 240-VAC output power directly to the house loads or back to the utility when excess is generated. The dc power is isolated from the utility by a transformer within the power conditioning unit. The system operation is automatic and the output is synchronized with the utility. The system automaticallyshuts down with loss of utility. The overall system is connected in parallel with he utility service to supply the residential load. The installation of the modules was completed as planned by a local contractor without any problems. No module damage occurred during installation or in shipping and the measured array output was slightly above predictions.

DE82900679 MF **A01**
Aeronautical Research Inst. of Sweden, Stockholm.
Study of WECS Farm Area and WECS Safety Limit Requirements Minutes from Export Meeting IEA R and D WECS Annex I sub-Task A1.
S. Eggwertz. Jun 80, 119p FFA-HU-2218, NE/VIND-80-9
Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The expert meeting of the IEA Wind Energy Conversion Systems (WECS) Sub-Task A1 was held in Stockholm on February 25, 1980. The number of participants was 42 from seven countries. The morning session comprised technical descriptions of the two Swedish 2-3 MW prototype units and reports from safety studies performed in U.S.A., Netherlands and Denmark. In the afternoon the Swedish work on safety of WECS, which has recently resulted in a preliminary report, was reviewed. Separate contributions were given from SAAB-SCANIA concerning fault-tree analysis of systems and load case recommendations. A short discussion concluded the day. It was resumed informally on the following day during an excursion to the Kalkugnen experimental wind turbine unit where mainly the foreign delegates took part. (ERA citation 07:043201)

DE82902431 PC **A04**/MF **A01**
Netherlands Energy Research Foundation ECN, Petten.
Statistical Methods for the Assessment of Wind-Power Integration into the Electricity-Supply System.
A. J. Janssen, T. D. Oei, and J. B. Dragt. Oct 81, 58p ECN-101
U.S. Sales Only.

The results are summarized of studies on system integration problems of wind power, conducted at ECN within the framework of the Dutch National Wind Research Program. Statistical methods, determining power supply reliability, were used to evaluate the conventional capacity that can be displaced by wind power. Characteristics of two standard wind turbines were used, together with wind data of four Dutch weather stations. System demand and conventional generating plant relevant to the Dutch grid were considered in the calculations. A statistical method was also used to point out trends with respect to possible fuel savings due to wind power integration and desirable changes in the conventional plant mix. (ERA citation 07:043897)

DE82903666 MF **A01**
Southwest Research Inst., San Antonio, TX.
Basic Techniques in Availability Engineering. Final Report.
A. Sharif-Homayoun, R. D. Shirley, B. M. Tashjian, V. B. Parr, and R. H. Koppe. May 82, 164p EPRI-NP-2166
Portions of document are illegible.
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Power plant productivity improvement can be achieved through application of the principles of availability engineering and decision analysis. Germaine to the application of these methodologies is the correct data usage in equations, algorithms, and criteria such that the applications result in the best decision for productivity improvement. The basic techniques of availability engineering are developed in this volume, and examples are presented for each element.

DE82903667 MF **A01**
Kinetics Technology International Corp., Pasadena, CA.
Assessment of a Coal-Gasification Fuel-Cell System for Utility Application. Final Report.
P. G. Cronin, A. J. Murphy, R. J. Newton, and E. S. Wagner. May 82, 168p EPRI-EM-2387
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The purpose of this scoping study was to define and assess the technical and economic feasibility of a coal gasification-advanced phosphoric acid fuel cell power plant for electric utility application. The system design criteria sélected resulted in a modular, relatively small sized power plant that could be configured with a basic building block of appoximately 11 MW. A range of coals and lignite was evaluated as the basic feedstock for a low-Btu fixed-bed conventional air-blown coal gasifier. The system included gas processing, cleanup, compression and delivery of sulfur-free hydrogen-rich gas to an advanced phosphoric acid fuel cell. Equipment erection and operating costs, in 1981 dollars, were solicited from American industry for all process sections. The plant was designed and evaluated on the basis of low capital cost, lowest overall heat rate and, as far as possible, with off-the-shelf technology. A 44 MW lignite example plant utilizing the basic building block concept was defined and evaluated for Lincoln, Nebraska, as an example site. The plant was configured in five basic configurations covering all reasonable schemes for utilizing byproduct tar/oil and waste heat. The all electric plant configuration provided an overall system heat rate of 10,330 Btu/kWh, a total erected capital cost including startup and contingency of $1291/kW (constant 1981 dollars), and a calculated electric busbar cost of 52.9 mills/kWh. The plant can be constructed in less than two years, has been designed to meet all Federal emission standards and is well suited for either base load or intermediate load utility application.

DE82903706 MF **A01**
Idaho Water and Energy Resources Research Inst., Moscow.
Potential Hydroelectric Energy Resources of Idaho.
C. C. Warnick, J. R. Filler, and P. J. Vance. Jun 81, 152p NP-2903706
Portions of document are illegible.
Available in microfiche only.

Data are compiled and presented on 1300 potential hydroelectric power sites in Idaho, on hydropower resource inventories and evaluations, and on existing hydroelectric facilities. The data include geographic location, head, and power capacity.

N82-29354/9 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
A New Strategy for Efficient Solar Energy Conversion: Parallel-Processing with Surface Plasmons.
L. M. Anderson. 1982, 13p NASA-TM-82867, E-1236
Presented at the 17TH Intersoc. Energy Conversion Eng. Conf., Los Angeles, 8-13 Aug. 1982; Sponsored by IEEE.

An advanced concept for direct conversion of sunlight to electricity, which aims at high efficiency by tailoring the conversion process to separate energy bands within the broad solar spectrum is introduced. The objective is to obtain a high level of spectrum-splitting without sequential losses or unique materials for each frequency band. In this concept, sunlight excites a spectrum of surface plasma waves which are processed in parallel on the same metal film. The surface plasmons transport energy to an array of metal-barrier-semiconductor diodes, where energy is extracted by inelastic tunneling. Diodes are tuned to different frequency bands by selecting the operating voltage and geometry, but all diodes share the same materials.

N82-29716/9 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Analysis and Design of a 10 to 30 kw Grid-Connected Solar Power System for the JPL Fire Station and First Aid Station.
R. H. Josephs. 15 Apr 82, 57p NASA-CR-169157, JPL-PUBL-82-51
Contracts NAS7-100, DE-AI01-80CS-30507
Sponsored in Part by NASA.

The design and performance of a modestly sized utility-connected power conditioning system and its supporting photovoltaic collector are described and estimated. Utility preparations and guidelines to conform with the output of a small generating station with that of a large power network are examined.

N82-29718/5 PC **A03**/MF **A01**
Institute of Gas Technology, Chicago, IL. Engineering Research Div.
Stabilizing Platinum in Phosphoric Acid Fuel Cells.
Final Report, Dec. 1980 - Mar. 1982.
R. J. Remick. Jul 82, 47p NASA-CR-165606, DOE/NASA/0208-4
Contracts DEN3-208, DE-AI01-80ET-17088

Platinum sintering on phosphoric acid fuel cell cathodes is discussed. The cathode of the phosphoric acid fuel cell uses a high surface area platinum catalyst dispersed on a conductive carbon support to minimize both cathode polarization and fabrication costs. During operation, however, the active surface area of these electrodes decreases, which in turn leads to decreased cell performance. This loss of active surface area is a major factor in the degradation of fuel cell performance over time.

N82-29719/3 PC **A11**/MF **A01**
California Univ., Berkeley. Earl Warren Legal Inst.
Current Legal and Institutional Issues in the Commercialization of Phosphoric Acid Fuel Cells.
Final Report.
J. T. Nimmons, K. D. Sheehy, J. R. Singer, and T. C. Gardner. Jan 82, 238p NASA-CR-167867, DOE/NASA/0111-1
Contracts NAG3-111, DE-AI01-80ET-17088

Legal and institutional factors affecting the development and commercial diffusion of phosphoric acid fuel cells are assessed. Issues for future research and action are suggested. Perceived barriers and potential opportunities for fuel cells in central and dispersed utility operations and on-site applications are reviewed, as well as the general concept of commercialization as applied to emerging energy technologies.

N82-29720/1 PC **A04**/MF **A01**
DHR, Inc., Washington, DC.
Application of Photovoltaic Electric Power to the Rural Education/Communication Needs of Developing Countries.
Final Report.
A. Cabraal, D. Delansanta, and G. Burrill. Jul 82, 61p NASA-CR-167894, NAS 1.26:167894
Contract DEN3-248
Prepared in Cooperation with Associates in Rural Development, Inc., Burlington, VT. Sponsored in Part by Agency for International Development.

The suitability (i.e., cost competitiveness and reliability) of photovoltaic (PV) power systems for rural applications in developing countries is considered. Potential application sectors include health delivery, education and communication where small amounts of electricity are needed to meet critical needs.

N82-29721/9 PC **A08**/MF **A01**
Aerospace Corp., El Segundo, CA.

Environmental Assessment of the 40 Kilowatt Fuel Cell System Field Test Operation.
Final Report.
G. Bollenbacher. May 82, 160p DOE/NASA/2701-1, NASA-CR-167923
NASA ORDER C-42701D, Contract DE-AI01-80ET-17088

This environmental assessment examines the potential environmental consequences, both adverse and beneficial, of the 40 kW fuel cell system system field test operation. The assessment is of necessity generic in nature since actual test sites were not selected. This assessment provides the basis for determining the need for an environmental impact statement. In addition, this assessment provides siting criteria to avoid or minimize negative environmental impacts and standards for determining candidate test sites, if any, for which site specific assessments may be required.

N82-29722/7 PC **A05**/MF **A01**
Hughes Research Labs., Malibu, CA.
Medium Energy Proton Radiation Damage to (AlGa)As-GaAs Solar Cells.
Final Report, 8 Aug. 1979 - 1 May 1982.
R. Y. Loo, G. S. Kamath, and R. C. Knechtli. Jul 82, 93p NASA-CR-165946, NAS 1.26:165946
Contract NAS1-15926

The performance of (AlGa)As-GaAs solar cells irradiated by medium energy 2, 5, and 10 MeV protons was evaluated. The Si cells without coverglass and a number of GaAs solar cells with 12 mil coverglass were irradiated simultaneously with bare GaAs cells. The cell degradation is directly related to the penetration of depth of protons with GaAs. The influence of periodic and continuous thermal annealing on the GaAs solar cells was investigated.

N82-29724/3 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Materials Science and Engineering.
Processed-Induced Defects in EFG Ribbons.
B. Cunningham, and D. G. Ast. May 82, 14p NASA-CR-169205, DOE/JPL-956046-82/3
Contract JPL-956046
Sponsored in Part by Doe Prepared for JPL.

The defect structure of processed edge defined filmfed growth (EFG) silicon ribbons was studied using a variety of electron microscopic techniques. Comparison between the present results and previous studies on as-grown ribbons has shown that solar cell processing introduces additional defects into the ribbons. The creation of point defects during high temperature phosphorus diffusion induces dislocation climb, resulting in the formation of dislocation helices in the diffused layer.

PB82-250846 CP **T02**
National Energy Information Center, Washington, DC.
Power Plant Report - Historical.
Data file,
Melvin Johnson, and Raymond Marcotte. 1981, mag tape DOE/DF-82/014
Supersedes PB82-191594.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Purpose of Form EIA-759 formerly FPC-4, Power Plant Report is to collect data necessary to fulfill regulatory responsibility; ensure power reliability; and measure fuel consumption and power production. This data tape contains the data collected by the survey. Specific ownership code, prime mover code, kind of fuel code, company code, plant name, current capacity, fuel name, old capacity, effective data - month/year, status, multistate code, current year, generation, consumption, stocks, electric plant code, NERC code.

PB82-258047 PC **A04**/MF **A01**
National Oceanic and Atmospheric Administration, Washington, DC. Office of Ocean Minerals and Energy.
Ocean Thermal Energy Conversion: Environmental Effects Assessment Program Plan 1981-85.
Jun 82, 63p NOAA-82072903

Public Law 96-320, the Ocean Thermal Energy Conversion (OTEC) Act of 1980, was enacted on August 3, 1980. The Act sets as its primary goal the establishment of a legal regime which will permit and encourage the development of ocean thermal energy conversion as a commercial energy technology. The Administrator has delegated NOAA's responsibilities under P.L. 96-320 to the Office of Ocean Minerals and Energy which, among other activities, has developed the plan, as presented in this document. It is a generic plan regarding the environmental effects of OTEC development and thus extends beyond NOAA's purview. The Plan has the primary objective of obtaining the environmental information and knowledge required to allow the commercial development of OTEC to the maximum extent that is compatible with acceptable environmental risk. This plan describes the program of research for FY 1981-1985 that is necessary to begin to assess the effects on the environment of ocean thermal energy conversion facilities and plantships.

PB82-260720 PC **A05**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States: Methodology and Summary.
Mar 82, 80p
Contract DI-0-07-DV-00031
See also PB82-260738.
Also available in set of 7 reports PC E99, PB82-260712.

This report represents the Third Phase of the Low-Head Hydroelectric Evaluation and Inventory Study. The purpose of this report is to describe the studies and evaluations on 86 potential hydropower sites. This report includes a summary of Phase III findings as well as a summary of the study methodology. Individual site reports including preliminary design, cost estimates, economic analyses and environmental and social impact assessments are contained in 6 parts of the Appendix: Part I - California; Part II - Colorado; Part III - Idaho, Utah; Part IV - Kansas, New Mexico, Oklahoma, Texas; Part V - Montana, Wyoming; Part VI - Oregon, Washington.

PB82-260738 PC **A06**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States: Appendix, Part I - California.
Mar 82, 111p
Contract DI-0-07-DV-00031
See also PB82-260720, and PB82-260746.
Also available in set of 7 reports PC E99, PB82-260712.

The 9 site reports for California contained in Part I of the Appendix are part of the Phase III, Low-Head Hydroelectric Evaluation and Inventory Study. These specific site reports contain a project description, a preliminary evaluation of potential social and environmental impacts that could result from development of the project, a summary and details of the powerplant economic studies, and a project plan layout.

PB82-260746 PC **A08**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States: Appendix, Part II - Colorado.
Mar 82, 161p
Contract DI-0-07-DV-00031
See also PB82-260738, and PB82-260753.
Also available in set of 7 reports PC E99, PB82-260712.

The 14 site reports for Colorado contained in Part II of the Appendix are part of the Phase III, Low-Head Hydroelectric Evaluation and Inventory Study. These specific site reports contain a project description, a preliminary evaluation of potential social and environmental impacts that could result from development of the project, a summary and details of the powerplant economic studies, and a project plan layout.

PB82-260753 PC **A09**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States. Appendix, Part III - Idaho and Utah.
Mar 82, 177p
Contract DI-0-07-DV-00031
See also PB82-260746, and PB82-260761.
Also available in set of 7 reports PC E99, PB82-260712.

The 9 site reports for Idaho and 6 site reports for Utah contained in Part II of the Appendix are part of the Phase III, Low-Head Hydroelectric Evaluation and Inventory Study. These specific site reports contain a project description, a preliminary evaluation of potential social and environmental impacts that could result from development of the project, a summary and details of the powerplant economic studies, and a project plan layout.

PB82-260761 PC **A09**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States: Appendix, Part IV - Kansas, New Mexico, Oklahoma and Texas.
Mar 82, 196p
Contract DI-0-07-DV-00031
See also PB82-260753, and PB82-260779.
Also available in set of 7 reports PC E99, PB82-260712.

The 3 site reports for Kansas, 4 site reports for New Mexico, 4 site reports for Oklahoma and 6 site reports for Texas contained in Part II of the Appendix are part of the Phase III, Low-Head Hydroelectric Evaluation and Inventory Study. These specific site reports contain a project description, a preliminary evaluation of potential social and environmental impacts that could result from development of the project, a summary and details of the powerplant economic studies, and a project plan layout.

PB82-260779 PC **A08**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States: Appendix, Part V - Montana and Wyoming.
Mar 82, 171p
Contract DI-0-07-DV-00031
See also PB82-260761, and PB82-260787.
Also available in set of 7 reports PC E99, PB82-260712.

The 12 site reports for Montana and 3 site reports for Wyoming contained in Part II of the Appendix are part of the Phase III, Low-Head Hydroelectric Evaluation and Inventory Study. These specific site reports contain a project description, a preliminary evaluation of potential social and environmental impacts that could result from development of the project, a summary and details of the powerplant economic studies, and a project plan layout.

PB82-260787 PC **A09**/MF **A01**
Tudor Engineering Co., Denver, CO.
Report on Assessment of Low-Head Hydroelectric Sites in the Western States: Appendix, Part VI - Oregon and Washington.
Mar 82, 182p
Contract DI-0-07-DV-00031
See also PB82-260779.
Also available in set of 7 reports PC E99, PB82-260712.

The 8 site reports for Oregon and 8 site reports for Washington contained in Part II of the Appendix are part of the Phase III, Low-Head Hydroelectric Evaluation and Inventory Study. These specific site reports contain a project description, a preliminary evaluation of the potential social and environmental impacts that could result from development of the project, a summary and details of the powerplant economic studies, and a project plan layout.

PB82-263526 PC **A06**/MF **A01**
Pope, Evans, and Robbins, Inc., New York.
Congeneration Feasibility: Otis Elevator Company and Polychrome Corporation.
Final rept.,
Herbert Fox. May 82, 118p NYSERDA-82-17
Sponsored in part by the Otis Elevator Co., Yonkers, NY., Polychrome Corp., Yonkers, NY., and Westchester County, NY.

This report summarizes an investigation of the technical and economic feasibility of cogenerating electric and thermal power at two manufacturing plants (Otis Elevator Company and Polychrome Corporation) located on neighboring properties in Yonkers, NY. Existing electrical- and steam-producing equipment and energy consumption date are summarized. Alternative cases examined include electrical energy generation, electrical energy generation with waste heat recovery and a combined cycle case. Also reported are life cycle cost economic evaluations including simple payback period and return-on-investment indices. While it

was concluded that cogeneration of heat and electricity at these industrial plant sites would not be economically viable, this detailed study provides valuable insight into the types of problems encountered when considering cogeneration feasibility.

PB82-875212 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Silicon Solar Cells. 1974-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Sep 82.
Sep 82, 129p
Supersedes PB80-850290.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the technology of polycrystalline silicon with applications for photovoltaic and solar cells. Thin-film polycrystalline silicon solar cells are considered relative to such topics as deformation, recrystallization, thermal conductivity, optical properties, grain boundary passivation, junction formation , and device configurations. Reliability, efficiency and costing are included as well as terrestrial applications. (This updated bibliography contains 129 citations, 55 of which are new entries to the previous edition.)

PB82-875931 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Solar Cells: Low Cost. June, 1974-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jun 74-Sep 82.
Sep 82, 105p
Supersedes PB80-851991.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the manufacturing cost analysis, practicality and economic viability of low-cost silicon solar cell production. Near-term technology for processes such as silicon ribbon growth, deformation, deposition, rheotaxy, and recrystallization are presented. Spray deposited films for silicon, alloys, and photovoltaic substrates emphasizing energy conversion efficiency are included. (This updated bibliography contains 97 citations, 43 of which are new entries to the previous edition.)

10C. Energy Storage

AD-A118 696/4 PC **A05**/MF **A01**
Honeywell Power Sources Center, Horsham, PA.
High Efficiency Lithium-Thionyl Chloride Cell.
Final research and development technical rept. 10 Apr 81-9 May 82,
Narayan Doddapaneni. Aug 82, 97p DELET-TR-81-0381-F
Contract DAAK20-81-C-0381

The polarization characteristics and the specific cathode capacity of Teflon bonded carbon electrodes in the Li/SOCl2 system have been evaluated. Doping of electrocatalysts such as cobalt and iron phthalocyanine complexes improved both cell voltage and cell rate capability. High efficiency Li/SOCl2 cells were thus achieved with catalyzed cathodes. The electrochemical reduction of SOCl2 seems to undergo modification at catalyzed cathode. For example, the reduction of SOCl2 at FePc catalyzed cathode involves 2-1/2 e-/mole of SOCl2. Furthermore, the reduction mechanism is simplified and unwanted chemical species are eliminated by the catalyst. Thus a potentially safer high efficiency Li/SOCl2 can be anticipated.

DE82014614 PC **A05**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Maintenance-Free, Deep-Discharge, Lead-Acid Battery for Photovoltaic Applications.
J. Szymborski. Apr 82, 99p SAND-82-7026
Contract AC04-76DP00789
Microfiche only after original copies are exhausted.

Progress in the development, design, fabrication, and testing of totally maintenance-free sealed lead-acid batteries suitable for the deep-discharge regimes of solar photovoltaic applications is reported. The 6-volt, 100-ampere-hour battery was designed to meet these additional key design goals: 6-h nominal discharge rate; 80% depth-of-discharge daily duty cycle; 2000 cycles to an 80% depth-of-discharge; recharge in less than 8 h; 80% roundtrip energy efficiency; and self-discharge rate of less than 1% per week. Totally maintenance-free sealed operation was achieved by designing the cells so that only oxygen is generated on charge. The cells in this battery are fabricated with positive grids cast from a low antimony alloy in order to achieve both maintenance-free operation and good deep-cycle performance. Various cycle life tests and tests to determine the tolerance of the battery to operation and storage at various states-of-charge and over a wide range of temperatures were performed. The storage tests demonstrated the ability of this sealed battery to survive storage at 100, 50 and 0% (i.e., fully discharged) state-of-charge for extended periods at temperatures ranging from -18 to 50 exp 0 C. The charging parameters to adequately recharge the battery while minimizing overcharge and gassing have been extensively studied. Results of these experiments indicate that a fully discharged battery can be completely recharged in less than 10 h using a voltage-regulated, current-limited charging device. The capabilities of this new battery design which permit deep-discharge cycling, rapid recharging, operation and storage in less than a fully charged condition, and totally maintenance-free operation will eliminate one of the major problems in demonstrating the viability and practicality of solar photovoltaic and other renewable energy source systems. (ERA citation 07:047027)

DE82015027 PC **A08**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Geotechnical Issues and Guidelines for Storage of Compressed Air in Excavated Hard Rock Caverns.
R. D. Allen, T. J. Doherty, and A. F. Fossum. Apr 82, 164p PNL-4180
Contract AC06-76RL01830
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The results of a literature survey on the stability of excavated hard rock caverns are presented. The objective of the study was to develop geotechnical criteria for the design of compressed air energy storage (CAES) caverns in hard rock formations. These criteria involve geologic, hydrological, geochemical, geothermal, and in situ stress state characteristics of generic rock masses. Their relevance to CAES caverns, and the identification of required research areas, are identified throughout the text. This literature survey and analysis strongly suggests that the chief geotechnical issues for the development and operation of CAES caverns in hard rock are impermeability for containment, stability for sound openings, and hydrostatic balance.

DE82016065 PC **A03**/MF **A01**
Argonne National Lab., IL.
Research, Development, and Demonstration of Lead-Acid Batteries for Electric-Vehicle Propulsion. Annual Report for 1981.
Mar 82, 50p ANL/OEPM-81-10
Contract W-31-109-ENG-38

Heavy emphasis during this period was placed on construction and testing of the ISOA (Improved State of Art) battery and on completion of the battery design and assembly equipment for the downsized version of the ISOA, referred to in this report as the EV-190 battery. This effort, combined with a reduced funding level, restricted the program's planned research efforts during the fiscal year. Two 96 volt ISOA battery systems were assembled and delivered to the National Battery Test Laboratory. There they were subjected to extensive testing and then shipped to the Jet Propulsion Laboratory for installation and testing in vehicles. Throughout the testing of these packs technical support was supplied by Globe to both facilities. Several problems were encountered during testing, but those directly related to the battery were quickly resolved through subsystem modifications. All tooling for the EV-190 battery system was ordered, received, and checked for compliance with design specifications. Battery subsystem development efforts were concentrated on the design and preparation of the electrolyte circulation systems for the ISOA battery packs. Progress is reported. (ERA citation 07:047015)

DE82016066 MF **A01**
Argonne National Lab., IL.
Research, Development, and Demonstration of Lead-Acid Batteries for Electric-Vehicle Propulsion. Annual Report for 1981.
Mar 82, 39p ANL/OEPM-81-8
Contract W-31-109-ENG-38
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The development of the ISOA electric vehicle battery is summarized showing the progressive increase in performance and life attained since the initiation of the development program. The ISOA battery contains expanded Pb-Ca-Sn grids in both the positive and negative, whereas the advanced design has a cast Pb-Sb positive grid and an expanded Pb-Ca-Sn negative grid. The cycle life of the ISOA battery utilizing an expanded Pb-Ca-Sn grid was increased from 125 to 232 cycles while maintaining a specific energy of 37 WH/kg and increasing its capacity from 165 AH to 170 AH. (ERA citation 07:047014)

N82-29770/6 PC **A05**/MF **A01**
Odense Univ. (Denmark).
Project Electrochemical Energy Storage Systems 1. Jan. 1980 - 31. Dec. 1980. Report for the Ministry of Energy, February 1981.
J. Jensen. Feb 81, 83p DE82-900845, NP-2900845
Text in Danish.

Fabrication and properties of solid electrolytes, fast ion conductors, characterization and performance of solid solution electrodes, and battery applications studies and battery assessment are studied. The electrochemical research investigates materials with improved ionic conductivity - lithium nitrides and iodides, zeolites, and sodium ion conductors. Crystalline electrolytes (of TiS2/Li3N type) are investigated. Efficient batteries for propulsion purposes were evaluated from the economic and energy conservation point of view.

PB82-875659 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Energy Storage and Energy Utilization: Computer Analysis. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 225p
Supersedes PB81-853988.

This bibliography contains citations concerning computer simulations, mathematical modeling, and computer programs and calculations applied to energy storage and energy utilization. Topics include designs, techniques, media, equipment, and systems for a wide variety of energy sources, i.e., wind, flywheels, and electric generators, but chiefly solar sources. (This updated bibliography contains 170 citations, 55 of which are new entries to the previous edition.)

11.

MATERIALS

11A. Adhesives and Seals

DE82015479 PC **A04**/MF **A01**
Sandia National Labs., Livermore, CA.
Some Guidelines for the Mechanical Design of Coaxial Compression Pin Seals.
J. D. Miller, and S. N. Burchett. Apr 82, 55p SAND-82-0057
Contract AC04-76DP00789
Portions of document are illegible.
Microfiche only after original copies are exhausted.

In this report, the design considerations for a coaxial compression glass-to-metal pin seal with a particular material combination are investigated. The materials chosen for this study are an Alloy 52 conductor pin, Corning 9010 or kimble TM-9 glass insulator, and 304 stainless steel housing. The results of this investiga-

tion are presented in the form of guidelines to be used by design engineers. The design guidelines coupled with manufacturing guidelines should, when followed, yield a mechanically optimum glass-to-metal coaxial compression pin seal.

N82-29460/4 PC **A17**/MF **A01**
Boeing Aerospace Co., Seattle, WA.
Evaluation of High Temperature Structural Adhesives for Extended Service.
Final Report.
S. G. Hill, P. D. Peters, and C. L. Hendricks. Jul 82, 380p NASA-CR-165944, NAS 1.26:165944
Contract NAS1-15605

The evaluation, selection, and demonstration of structural adhesive systems for supersonic cruise research applications, and establishment of environmental durability of selected systems for up to 20,000 hours is described. Ten candidate adhesives were initially evaluated. During screening and evaluation, these candidates were narrowed to three of the most promising for environmental durability testing. The three adhesives were LARC-13, PPQ, and NR056X. The LARC-13 was eliminated because of a lack of stability at 505 K. The NRO56X was removed from the market. The LARC-TPI was added after preliminary evaluation and an abbreviated screening test. Only PPQ and LARC-TPI remained as the reasonable candidates late into the durability testing. Large area bond panels were fabricated to demonstrate the processibility of the selected systems. Specifications were prepared to assure control over critical material and process parameters. Surface characterization concentrated primarily upon titanium surface treatments of 10 volt chronic acid anodize, 5 volt chromic acid anodize and PASA-JELL. Failure analysis was conducted on lap shear adhesive bond failures which occurred in PPQ and LARC-13 test specimens after 10,000 hours at 505 K.

11B. Ceramics, Refractories, and Glasses

AD-A118 519/8 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Influence of Atmosphere Weathering on the Performance of Whetlerite.
Memorandum rept.,
Victor R. Deitz, R. J. Puhala, D. B. Stroup, and G. F. Dickey. 20 Aug 82, 48p Rept no. NRL-MR-4752

Commercial samples of ASC whetlerite, Lot 2-281, were exposed to specified flows of untreated outdoor air at the Naval Research Laboratory, the Atmospheric Physics facilities of the Argonne National Laboratory, and the Simi Valley Monitoring Station of the Air Pollution Control District of Ventura, California. The exposures were varied from one to 12 months. The air contaminants and moisture parameters were determined. After the exposures, the whetlerite samples were evaluated by CK (cyanogen chloride) tests, by DMMP (dimethyl methyl phosphonate) tests, and for a limited number by AC (Hydrogen cyanide) tests. An analysis of the meteorological and industrial environments on the performance of the whetlerite will be presented. The CK 'life' of whetlerite is essentially destroyed as the result of the exposure to outdoor air during the hot and humid summer months or in warm climates. Whetlerite is relatively stable in outdoor air flows during cool, dry winter months. The results for DMMP life were found to be location dependent. A good correlation was found between the loss of CK activity and the dew point of the air flow. (Author)

AD-A118 837/4 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Materials Engineering.
Chemical Durability Improvement and Static Fatigue of Glasses.
Final technical rept. 1 Apr 78-31 Mar 82,
Minoru Tomozawa. Aug 82, 21p
Contract N00014-78-C-0315

The following research results were obtained: (1) The rate of corrosion of silica glass by hot alkaline solution was reduced when a small amount of calcium is added to the solution. This inhibitor effect was caused by the deposition of calcium on the glass surface and a protective film formation. Similar but less drastic effect was observed for other alkaline earth elements. When heavy alkaline earth elements such as strontium, barium are contained in the alkaline solution, severe, mechanically damaging surface flow developed; (2) Mechanical strength of high silica glass was measured in various solvents. The strength varied while the dynamic fatigue susceptibility did not; (3) Surface of silica glass was made hydrophobic by chemical reactions. The resulting glasses showed very little tendency of dynamic fatigue. ; (4) Dissolution rate of silica glass was found to increase under hydrostratic pressure; (5) The strength increase commonly observed for abraded glass immersed in water (crack blunting) was attributed to dissolution-precipitation mechanism rather than to simple dissolution; and (6) Dynamic fatigue susceptibility of sodium silicate glasses was found to increase with increasing water content in glass.

PB82-261124 PC **A03**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co, Ltd.: Volume 29, Number 1, 1979.
1979, 44p
Text in English and Japanese, abstract in English.

Document contains articles on the following subjects: Thin Glass Rod Formation by Preform Attenuation (Text in Japanese); Improvement of Mechanical Strength of Glassfibre Reinforced Asbestos Cement Produced by Hatscheck Process (Text in English); Pyrolysis Gas Chromatography for Fluoropolymers (Text in Japanese); and Adhesion of AFLAS (Text in Japanese).

PB82-261132 PC **A05**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 28, Number 2, 1978.
1978, 80p
Text in English and Japanese, abstract in English.

Document contains articles on the following subjects: Influence of Relaxation on Migration of Ions During Ion Exchange by Electrolysis in Glass (Text in English); Double Oblique Deposition for Multiplexable Twisted Nematic Liquid Crystal Displays (Text in English); Measurement of Fracture Energy of Glass Fiber Reinforced Cement Composites (Text in Japanese); Vulcanization of a Fluoroelastomer Derived from Tetrafluoroethylene and Propylene (Text in English); Wet Compression Set of High Resilient Foam (Text in Japanese) and Synthesis of the Brominated Oromatic Compounds Containing s-Triazine Ring as Flame Retardant (Text in Japanese).

PB82-261140 PC **A05**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 26, Number 1, 1976.
1976, 91p
Text in English and Japanese, abstract in English.

This volume contains the following eight articles: (1) Origin of Coloration of Borosilicate Glass by Electrically Heated Melting (Text in Japanese), (2) Microhardness and Structure of Thick Silica Films Prepared by Resistance Heating and Electron Beam Evaporation (text in Japanese), (3) Silver Halide Photochromic Coating by Vacuum Deposition (text in English), (4) Study on the Impact Safety Performance of Windshield with a Sled-Dummy Text Device (Text in Japanese), (5) Deterioration of Reference Sample in the X-ray Fljorescence Analysis of Sheet Glasses (Text in Japanese), (6) A New Synthetic Method of Perfluoroalkylethyl Alcohol (Text in English), (7) Properties of Filler Compounded Ethylene-Tetrafluoroethylene Copolymer (Text in English), and (8) A Lead Bonding Machine to Glass Substrate for Mass Production (Text in Japanese).

PB82-261157 PC **A04**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 26, Number 2, 1976.
1976, 66p
Text in English and Japanese, abstract in English.

Document contains articles on the following subjects: The Strengthening of Mixed Alkali Glass by Ion Exchange (Text in Japanese); Multiplexing Characteristics of Twisted Nematic Liquid Crystal Display (Text in Japanese); Analysis of Tetrafluoroethylene-Hexafluoropropylene Copolymer (Text in Japanese); Reinforcing Effect of Poly-phenylene Sulfide Treated Glass Fiber on Polytetrafluoroethylene (Text in Japanese); and Reinforced Thermoplastics for Acoustic Use (Text in English).

PB82-262783 PC **A02**/MF **A01**
Bureau of Mines, University, AL. Tuscaloosa Research Center.
Refractory Properties of Brick Produced from Beneficiated Chrome-Containing Furnace Linings.
Rept. of investigations/1982,
Arthur V. Petty, Jr. Jul 82, 22p BUMINES-RI-8685

In Bureau of Mines research on recycling chrome-containing refractory wastes, used refractories from argon-oxygen decarburization and electric steelmaking furnaces were beneficiated. By means of dry magnetic separation on minus 6-mesh crushed wastes, a concentrate was produced. After minor adjustments to the particle size distribution, full-size refractory brick were dry-pressed by a commercial producer and fired to 1,450 and 1,730C. Standard testing procedures were used to determine the cold-crushing strength, modulus of rupture at 25, 1,300, and 1,500C, hot load, thermal shock resistance, thermal expansion, and slag resistance. Optical and electron microscopy were used to determine grain-bonding mechanisms, and energy dispersive analysis of X-rays was used to determine elemental distribution. The test results indicate that the beneficiated material could be used to produce a refractory product suitable for moderate-temperature applications.

PB82-263823 PC **A04**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 30, Number 1, 1980
1980, 72p
Text in English and Japanese, abstract in English. Also pub. as ISSN-0004-4210.

Document contains articles on the following: Strength of Glass with Vacuum-Deposited Metal Films: Cr, Al, Au and Ag (Text in Japanese); Chemical Durability of Glasses in the Systems SiO2-CaO-Na2O-R sub m O sub n (Text in Japanese); Frost Resistance and Pore Structure of Glass Fiber Reinforced Cement Composites (Text in English); Stability of Basic Materials at High Temperature under Reducing Conditions (Text in Japanese); Copolymerization of Tetrafluoroethylene and Ethylene in Chlorofluorocarbon Solvents (Text in English); Determination of Valences of Selenium in Glass (Text in Japanese).

PB82-263849 PC **A04**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 31, Number 1, 1981.
1981, 70p
Text in English and Japanese, abstract in English. Also pub. in ISSN-0004-4210.

Document contains articles on the following: Effects of Loading Mode on Fracture Mirror of Glass (Text in Japanese); Preparation of Perfluoroalkyltriazine Derivatives and their Application as Oil Repellent Finishing Agents for Fabrics (Text in English); Determination of Chlorine, Bromine, Phosphorus and Sulfur in Organic Compounds by Using Ion Chromatography (Text in Japanese); Technical Data - Safety of Window Glasses Against Impact Forces at Home and School (Text in Japanese); Technical Data - 'Surflon' (Text in Japanese).

PB82-266875 PC **A05**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd. Volume 28, No. 1, 1978.
1978, 85p
Text in Japanese and English, abstract in English.

Document contains articles on the following subjects: The Behavior of Sodium Sulfate During the Glass Melting Reaction (Text in Japanese); A Theoretical Analysis of Danner Process (Text in Japanese); Optical Properties of In2O3 Coated Cover Glass for Solar Collector (Text in Japanese); Instrumented Charpy Impact Testing of Silicon Carbide (Text in English); A New Process for Malodor Control frum a Sewage Treatment

Plant (Text in Japanese); and A New Control Simulator using the Minimum Variance Control Algorithm (Text in Japanese).

PB82-811282 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Silicon Nitride Ceramics and Refractories. 1977-July, 1982 (Citations from the NTIS Data Base).
Sep 82, 313p
Supersedes PB81-807174 and PB80-806631.

Reports covering the properties, structure, preparation, fabrication, testing, and applications of silicon nitride are cited. Applications include gas turbine components, nuclear reactor materials, dielectrics, bearings, tools, heat exchangers, magnetohydrodynamic generators, and use in coal gasification plants. Reports on silicon oxynitride and silicon metal oxynitride are included. (This updated bibliography contains 304 citations, 60 of which are new entries to the previous edition.)

PB82-811290 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Silicon Nitride Ceramics and Refractories. 1976-July, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 256p
Supersedes PB81-807166 and PB80-806649.

Reports covering the properties, structure, preparation, fabrication, testing, and applications of silicon nitride are cited. Applications include gas turbine components, dielectrics, tools, magnetohydrodynamic generators, and use in coal gasification plants. Reports on silicon oxynitride and silicon metal oxynitride are included. (This updated bibliography contains 247 citations, 31 of which are new entries to the previous edition.)

PB82-875279 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Piezoelectric Ceramics. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 313p

This bibliography contains citations concerning properties and applications of piezoelectric ceramics. Structural, dielectric, electromechanical, and dilatational properties are discussed. Design and analysis techniques of piezoceramic devices are included. Electrical and mechanical loss evaluations are considered. (Contains 287 citations fully indexed and including a title list.)

PB82-876129 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Chinaware Manufacturing. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 82p
Supersedes PB80-851405.

This bibliography contains citations concerning chinaware manufacturing technology. History of chinaware manufacturing, developments, up-to-date processing and firing techniques are presented. Application of porcelain and additives to different substrates are included as well as energy efficient processing techniques. (This updated bibliography contains 86 citations, 31 of which are new entries to the previous edition.)

11C. Coating, Colorants, and Finishes

DE82015717 PC **A08**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Ultraviolet-Radiation-Curable Paints.
A. M. Grosset, W. F. A. Su, and E. Vanderglas. 30 Sep 81, 168p DOE/CS/40210-T2
Contract AC01-79CS40210
Portions of document are illegible.
Microfiche only after original copies are exhausted.

In product finishing lines, ultraviolet radiation curing of paints on prefabricated structures could be more energy efficient than curing by natural gas fired ovens, and could eliminate solvent emission. Diffuse ultraviolet light can cure paints on three dimensional metal parts. In the uv curing process, the spectral output of radiation sources must complement the absorption spectra of pigments and photoactive agents. Photosensitive compounds, such as thioxanthones, can photoinitiate unsaturated resins, such as acrylated polyurethanes, by a free radical mechanism. Newly developed cationic photoinitiators, such as sulfonium or iodonium salts (the so-called onium salts) of complex metal halide anions, can be used in polymerization of epoxy paints by ultraviolet light radiation. One-coat enamels, topcoats, and primers have been developed which can be photoinitiated to produce hard, adherent films. This process has been tested in a laboratory scale unit by spray coating these materials on three-dimensional objects and passing them through a tunnel containing uv lamps.

PB82-252024 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Development of Interim Performance Criteria for Restoration Coatings for Porcelain Enamel Surfaces.
James F. Seiler, and Paul G. Campbell. Jul 82, 54p NBSIR-82-2553
Sponsored in part by Department of Housing and Urban Development, Washington, DC. Div. of Energy, Building Technology and Standards.

A study was performed to develop interim performance criteria for restoration coatings for porcelain enamel surfaces. The laboratory study consisted of evaluating five restoration coatings which had been applied to porcelain enamel test panels with various surface conditions. Performance characteristics of the coatings examined included appearance, adhesion, impact resistance, stain resistance and fungal resistance. Existing test methods were used in the study if appropriate methods were available. However, the laboratory studies led to the development of a new cyclic exposure test and the use of a newly developed method for measuring adhesion. Adhesion of the coatings was the performance characteristic most sensitive to change with time of exposure to the newly developed cyclic exposure test. Interim performance criteria for restoration coatings for porcelain enamel surfaces were developed, based upon the results of the laboratory study. Additional studies are being conducted to assess the performance and durability of selected restoration coatings applied to bath tubs in public housing units. Since the field studies are not yet completed, they are not addressed in this report.

PB82-875030 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Corrosion Resistant Coatings. 1974-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Sep 82.
Sep 82, 199p
Supersedes PB82-854373.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning corrosion resistant coating state of the art technology. Techniques and applications of such coatings as aluminum, chromium, nickel, ceramics, and plastics for such metals as steel, nickel, titanium, and cobalt are included. Coating processes and applications in the aerospace industry are included. (This updated bibliography contains 191 citations, 13 of which are new entries to the previous edition.)

PB82-875519 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Antifouling Coatings for Marine Environments. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 66p
Supersedes PB81-858458.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning research reports on the use of antifouling and anticorrosive materials in the marine environment. Included are paints, metal cladding and plastic coatings, as well as cathodic protection. The use of marine concrete as a protective medium is also reviewed. (This updated bibliography contains 55 citations, 9 of which are new entries to the previous edition.)

PB82-875709 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Polymeric Coatings for Paper Products. 1976-September, 1982 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Sep 82.
Sep 82, 327p
Supersedes PB81-874612.

This bibliography contains citations concerning manufacturing processes, machining, and performance test results of various thermosetting and thermoplastic coatings for paper products. Among the polymers included in the discussion are polyethylene, vinyl, latex, polyester, acrylic, silicon, polymer and clay, styrene, and polyurethane compounds. Curing techniques, paper and odor control, polymeric pigment coatings, coating processes, and applications of plastic coated paper products are included. (This updated bibliography contains 232 citations, 39 of which are new entries to the previous edition.)

11D. Composite Materials

AD-A118 579/2 PC **A02**/MF **A01**
Texas A and M Univ., College Station. Dept. of Mathematics.
Final Scientific Report on AFOSR-77-3290.
Final scientific rept. 1 Apr 77-31 Mar 82,
Jay R. Walton. Mar 82, 14p AFOSR-TR-82-0647
Grant AFOSR-77-3290

This report summarizes progress on several theoretical questions concerning contact and fracture phenomena for elastic and viscoelastic material. Specifically, the following topics are discussed: (1) quasi-static sliding contact problems for power-law linearly viscoelastic material; (2) the quasi-static propagation of a crack by a rigid wedge through an infinite power-law linearly viscoelastic body; (3) solution techniques of systems for generalized Abel integral equations with application to simultaneous sets of dual integral equations and interfacial cracks in elastic material; (4) the application of conservation integral techniques to the calculation of energy release rates for elastic interfacial edge cracks; (5) static thermo-elastic interfacial edge cracks; and (6) the dynamic, steady-state fracture of general linearly viscoelastic material. (Author)

AD-A118 590/9 PC **A04**/MF **A01**
McDonnell Aircraft Co., St. Louis, MO.
Physiochemical/Rheological Control of Nonmetallic Materials.
Final technical rept. 1 Aug 81-1 Aug 82,
James F. Carpenter. Aug 82, 51p
Contract N00019-81-C-0119

The objective of this program has been to evaluate the use of physiochemical and rheological methods to improve the quality control nonmetallic consumables used in the bonding and production of composites and also the quality control of foaming adhesives. (Author)

DE82013639 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Prediction of Long-Term Failure in Kevlar 49 Composites.
F. P. Gerstle, Jr. 1982, 52p SAND-81-2072C, CONF-820340-2
Contract AC04-76DP00789
Symposium on compression testing of homogenous materials and composites, Williamsburg, VA, USA, 10 Mar 1982.

Creep rupture data in Kevlar 49 epoxy usually exhibit considerable scatter: the coefficient of variation (CV) about the mean failure time at a given stress exceeds 100%. Quasi-static strength data, in contrast, shows

little scatter: <4% CV for pressure vessels and <10% for impregnated strands. In this paper analysis of existing creep rupture data on Kevlar epoxy vessels at four storage pressures has produced an interesting and useful result. It was found that a significant portion of the scatter in failure times for pressure vessels is due to spool-to-spool variation in the eight spools of Kevlar fibers used to wind the vessels. The order rank of mean times to failure was consistent over a pressure range from 3400 to 4300 psi, 68 to 86% of short term burst. Also, the coefficient of variation about the mean failure time for each spool was less than that for the total sample. The statistical inference that the sample is nonhomogeneous was supported by a nonparametric check using the Kruskal-Wallis test, and by a parametric analysis of variance. The order rank found in long-term tests did not unequivocally agree with static strength ranks; several spool sets were distinctly high or low. The implication is that, while static strengths are not valid predictors of long-term behavior, short term creep rupture tests at high stress definitely are. The material difference which causes the spool-to-spool variations has not yet been identified for all eight spools. However, it appears that Kevlar behavior at lower pressures may be predicted through the use of curves fitted to the data for each spool. A power law relating failure time to pressure, t = t sub 0 (p/p sub 0)/sup m/, was found to fit the data reasonably well. The implication is that, both in composite vessel design and in creep rupture experiments, the pressure (or stress) level be carefully controlled.

N82-29363/0 PC **A06**/MF **A01**
Hughes Aircraft Co., Torrance, CA. Electron Dynamics Div.
Pyrolytic Graphite Collector Development Program.
Final Report.
W. J. Wilkins. 25 Feb 82, 123p NASA-CR-167909, NAS 1.26:167909
Contract NAS3-22505

Pyrolytic graphite promises to have significant advantages as a material for multistage depressed collector electrodes. Among these advantages are lighter weight, improved mechanical stiffness under shock and vibration, reduced secondary electron backstreaming for higher efficiency, and reduced outgassing at higher operating temperatures. The essential properties of pyrolytic graphite and the necessary design criteria are discussed. This includes the study of suitable electrode geometries and methods of attachment to other metal and ceramic collector components consistent with typical electrical, thermal, and mechanical requirements.

N82-29459/6 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Tribological Evaluation of Composite Materials Made from a Partially Fluorinated Polyimide.
R. L. Fusaro. Apr 82, 40p NASA-TM-82832, E-1199

Preliminary tribological studies on a new polyimide formulated from the diamine 2,2-bis 4-(4-aminophenoxy) phenyl hexafluoropane (4-BDAF) indicates polyimides made from this diamine have excellent potential for high temperature applications. Two different polyimides were formulated from the diamine, and five different composites were formulated using one of the polyimides. Composites were made using 10 weight percent (w/o) graphite fluoride powder, 20 w/o PTFE powder, 30 w/o silver powder, or 50 w/o carbon fibers, both graphitic and nongraphitic types. The powder additions did not improve the tribological properties as much as the carbon fibers, and the graphitic fibers produced better results than did the nongraphitic fibers. Results also indicated that improved high temperature stability and tribological properties may be obtained with a polyimide made from the dianhydride pyromellitic acid (PMDA) rather than the dianhydride benzophenonetetracarboxylic acid (BTDA).

11E. Fibers and Textiles

PB82-876418 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Antimicrobial Agents for Textiles. 1975-September, 1982 (Citations from World Textile Abstracts).
Rept. for 1975-Sep 82.
Sep 82, 134p
Supersedes PB81-866048.Prepared in cooperation with Shirley Inst., Manchester (England).

The bibliography contains citations concerning the use of antifungal and antibacterial agents as finishes for textiles. Antimicrobial agents (including metal complexes, wax emulsions, and phenols) are considered as finishes. The effectiveness, methods to evaluate their effectiveness, and the general assessment of these agents are discussed. (This updated bibliography contains 180 citations, 40 of which are new entries to the previous edition.)

11F. Metallurgy and Metallography

AD-A118 553/7 PC **A05**/MF **A01**
California Univ., Los Angeles. Dept. of Materials Science and Engineering.
Fundamental Investigation of the Retrogression and Reaging (RRA) of Commercial Al-Base Alloys and Its Effect on Stress Corrosion Cracking.
Annual progress rept. no. 1, 1 Mar 81-28 Feb 82,
A. J. Ardell, and J. K. Park. 26 May 82, 82p
Contract N00014-81-K-0292

The microstructure of 7075 Al, aged to the T6 and T76 temper conditions, has been carefully characterized with respect to the nature of the precipitate phases that exist in the matrix and in grain boundaries, and the parameters associated with their dispersions. The microstructural changes that occur during various retrogression and retrogression and reaging heat-treatments have been thoroughly documented. The possible consequences of these latter heat treatments on the stress-corrosion susceptibility and yield strength of Al 7075 are discussed. (Author)

AD-A118 614/7 PC **A04**/MF **A01**
California Univ., Davis. Dept. of Mechanical Engineering.
Fundamental Investigations of Superplastic Forming Processes.
Final scientific rept. 1 Feb 79-31 Jan 82,
Amiya K. Mukherjee, and A. Arieli. Mar 82, 74p
AFOSR-TR-82-0677
Grant AFOSR-79-0069

The elevated deformation behavior of Zn-22% Al alloy was investigated, with special emphasis on the micromechanisms of deformation. Constant strain rate data on flow stress vs strain rate at different temperature and with specimens with different grain sizes were analyzed. From this analysis the constitutive equations for superplastic creep, dislocation-climb creep, coble creep and Nabarro creep processes were established. Finally the results were depicted in the form of a three-dimensional deformation mechanism map with normalized parameters of grain size, temperature and stress as the coordinates. (Author)

AD-A118 619/6 Not available NTIS
Wisconsin Univ.-Madison. Dept. of Metallurgical and Mineral Engineering.
Solidification of Undercooled Monotectic Alloys,
J. H. Perepezko, C. Galaup, and K. P. Cooper. 1982, 13p ARO-17455.4-MS
Contract DAAG29-80-K-0068
Availability: Pub. in Proceedings of the Materials Research Society Symposium: Materials Processing Research in the Reduced Gravity Environment of Space, p491-501 1982 (No copies furnished bY DTIC/NTIS).

No abstract available.

AD-A118 674/1 PC **A02**/MF **A01**
Army Armament Research and Development Command, Watervliet, NY. Large Caliber Weapon Systems Lab.
A Single Specimen J-Based Fracture Toughness Test for High Strength Steels.
Final rept.,
J. A. Kapp, and J. H. Underwood. May 82, 25p
ARLCB-TR-82010, SBI-AD-E440 159
Presented at the National Symposium on Fracture Mechanics (14th), 29 Jun-1 Jul 81, UCLA, Los Angeles, CA.

A single specimen J-based fracture toughness test has been developed which results in accurate and reliable measurements for a high strength, low alloy steel with several yield strengths. The specimen used is a deeply cracked Charpy specimen tested in slow, three-point bending. A simple plastic stress analysis was performed which identifies a single point on the load-displacement trace at which the J-integral is calculated as an estimate of fracture toughness (Klc). The method can be applied inexpensively and may be used as a quality control measure of fracture toughness.

AD-A118 678/2 PC **A02**/MF **A01**
Army Armament Research and Development Command, Watervliet, NY. Large Caliber Weapon Systems Lab.
Improved Electrodeposited Low Contraction Chromium.
Final rept.,
E. S. Chen. Apr 82, 18p ARLCB-TR-82009, SBI-AD-E440 156

A systematic study was made to optimize the parameters for plating high quality LC chromium using standard chromic acid solutions and solutions containing vanadium additions. The results indicate that deposit strengths were improved substantially by aging the plating solution at 250 A hr/liter and by using current densities in excess of 120 A/sq dm. Under these conditions, hydrogen incorporation was reduced five-fold while hardness, strength, and cathode efficiency were maximized. A further improvement in deposit strength was obtained by adding vanadium as V2O5 at a concentration of 10 g/1 to standard chromic acid solutions. At higher concentrations, inferior deposits were produced that showed surface roughness, porosity, low strength, and higher hydrogen content.

AD-A118 716/0 PC **A03**/MF **A01**
Naval Weapons Center, China Lake, CA.
Hydrogen Embrittlement in 17-4PH Stainless Steel.
Final rept. 1981-1982,
Kenneth R. Hayes. Aug 82, 30p Rept no. NWC-TP-6343

Tensile and Charpy impact test specimens of 17-4PH stainless steel in Conditions. A, H900, H950, H1000, H1050, H1100, H1150 and H1150M were cathodically charged with hydrogen for various lengths of time. After charging, the specimens were mechanically tested at room temperature. The tensile tests were conducted at strain rates of 0.02, 0.2, 2.0, and 20 min-1. Changes in mechanical properties (reduction in area, ultimate strength, hardness) were correlated with heat treatment, hydrogen charging level, and strain rate. Scanning electron microscope (SEM) fractography was employed to characterize fracture surfaces and provide information concerning the failure modes that were operating. In the tensile investigation, hydrogen charging was shown to greatly reduce the percent reduction in area (% RA) of 17-4PH stainless steel in all heat treatment conditions. The decreases became more pronounced as the yield and ultimate strengths increased and with increased charging time. For a given charging treatment and aging condition the % RA was shown to be a function of strain rate, the largest decrease in % RA being measured at intermediate strain rates.

DE82009869 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Internal Hydrogen Embrittlement of Uranium-5.7 Weight Percent Niobium Alloy.
G. L. Powell, and W. G. Northcutt, Jr. 3 Mar 82, 7p
Y/DU-214, CONF-820625-1
Contract W-7405-ENG-26
International congress on hydrogen and materials, Paris, France, 7 Jun 1982.

Internal hydrogen embrittlement of U-5.7Nb alloy is manifest by an enhanced microvoid coalescence fracture mode and a loss in tensile ductility for hydrogen concentrations below 20 mu g/g. At higher concentrations, i.e., 36 mu g/g, very low ductilities and brittle fracture modes are observed along with evidence for hydride formation.

DE82010483 MF **A01**
Illinois Univ. at Urbana-Champaign. Materials Research Lab.
Science of Materials. Progress Report, January 1-December 31, 1980.
1980, 213p DOE/ER/01198-1369

Contract AC02-76ER01198
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The research program is designed to provide information concerning basic properties of materials that are important for the development of energy systems. The emphasis is on the synthesis and characterization of new materials with novel properties for future applications. The research program includes studies of the microchemistry and microstructure; the deformation, corrosion and fracture of metals, ceramics and alloy materials are of particular concern, as is the hydrogen embrittlement of metals; also under investigation are the mechanism of heat transfer across interfaces, catalytic properties of surfaces, and erosion of surfaces by fluid suspended particles. The new materials and materials configurations now being fabricated for research on energy applications include a variety of metastable ceramic, metallic, semiconducting and molecular assemblies.

DE82011985 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Mechanical Properties of 800-MeV Proton-Irradiated Metals.
R. D. Brown, and J. R. Cost. 1982, 17p LA-UR-82-672, CONF-820628-1
Contract W-7405-ENG-36
11. international symposium on effects of radiation on materials, American Society for Testing and Materials, Scottsdale, AZ, USA, 28 Jun 1982.

Accelerator beam line components and spallation neutron targets operate in an irradiation environment where changes in mechanical properties can adversely affect component integrity. The present work presents a preliminary study of the effects of low fluences (10 exp 19 to 10 exp 20 p/cm exp 2) of 800-MeV protons on the yield strength, tensile strength, and ductility of samples of 304 stainless steel, Alloy 718, molybdenum, and tantalum. Tensile samples (0.75 or 1.6 mm thick) were directly water cooled during irradiation and were tested at room temperature. For the 304 stainless steel and annealed Alloy 718, the yield strengths increased by about a factor of 3 and 1.6, respectively, while the ductility decreased approx. 30 and 40 percent. In the bcc metals (tantalum and molybdenum) the yield strengths increased by at least a factor of 2. Tantalum samples retained significant ductility at room temperature, while several molybdenum specimens broke at less than 0.2 percent strain. These irradiation-induced changes at low proton fluences should not impair the usefulness of these materials (other than molybdenum) in accelerator environments.

DE82012349 MF **A01**
Cornell Univ., Ithaca, NY. Materials Science Center.
Oxidation of a Ni60/Fe40 (100) Surface.
S. E. Greco. May 81, 122p DOE/ER/10501-3
Contract AC02-79ER10501
Thesis. Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The clean NiFe alloy showed a slight surface iron enrichment after annealing. Oxidation experiments were performed at temperatures from 373 K to 873 K and at pressures from 5 x 10 exp -9 torr to 1 x 10 exp -6 torr O sub 2 . The rate of oxygen uptake was found with AES to be linear in pressure and approximately independent of temperature. LEED indicated that a c(2 x 2) chemisorbed structure formed first, followed by oxide growth. Oxygen adsorption in general caused strong surface iron enrichment. At higher temperatures the iron segregation was more pronounced. Chemical shifts were observed in the low energy nickel and iron AES spectra upon oxidation (the same shifts that have been observed in oxidation studies of pure Ni and pure Fe). The oxide grew in an epitaxial FCC(111) layer from 743 K to 873 K, but in a non-epitaxial manner at 373 K. The nickel to iron ratio in oxides several layers thick was found to depend on the temperature at which the oxide was grown; at higher temperatures the oxide contained more iron. Annealing these oxides caused nickel in them to be replaced by iron from the substrate. At very high exposures (approx. 5000 L), the lattice constant of the FCC(111) oxide approximately doubled, suggesting the formation of a spinel-type structure.

DE82013040 MF **A01**
Stanford Univ., CA. Dept. of Materials Science and Engineering.
Modelling of Deformation and Fracture in High-Temperature Structural Materials. Annual Progress Report, February 1, 1981-February 28, 1982.
A. K. Miller. Feb 82, 64p SU-DMS-82-R-3
Contract AT03-76ER70057
Available in microfiche only.

The general objective of this project is to use Materials Science in developing models which can predict fracture of metals and alloys. Particular emphasis is placed on materials-limited aspects of energy technology which, in turn, leads to an emphasis on predicting fracture of high-temperature structural materials and fracture under complex histories and environments. Summaries of research progress are presented for: (1) modelling of fatigue crack initiation and growth; (2) modelling of strain softening; (3) modelling of multiaxial plastic flow; (4) development of a physical basis for calculating the MATMOD constants for alloys; and (5) subgrain and forest dislocation strengthening during isotropic hardening. Some of the highlights are: development of fatigue crack initiation and growth model; (FATIGMOD) which has the simulative and predictive capabilities to treat fatigue crack problems for smooth, small-flow, and large-flow conditions; application of FATIGMOD model to obtain constants for 707S-T6 aluminum alloy; MATMOD-4V equations are suitable starting basis for development of a general set of constitutive equations for multiaxial plasticity; data suggest that increasing the amount of Mg in Al can lead to increased strain rate sensitivity at high strain rates.

DE82013525 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Instability in Simple Shear Deformation of Stress-Softening Materials.
T. J. Burns, and T. G. Trucano. Mar 82, 37p SAND-82-0004
Contract AC04-76DP00789

A quasistatic stability analysis is performed for the problem of a stress-softening material undergoing dynamic one-dimensional simple shear. This analysis is basically algebraic in nature and deals strictly with the underlying linearized problem. A simple algebraic criterion for the onset of instability is developed. An application of the criterion to two steels is then made and compared with experimental data, and qualitative agreement is observed. The analysis is then refined in a special case to include the time-dependence of the underlying parallel flow in the stability method. For a simple constitutive assumption (that of a thermoviscous material), it is found that the refined analysis can yield a somewhat different stability criterion than the quasistatic analysis. The importance of this for the problem under consideration is also discussed.

DE82013529 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Thermal Conductivity of Electroless Nickel-Phosphorus Alloy Plating.
D. D. Smith. Apr 82, 16p Y-2269
Contract W-7405-ENG-26

Properties of specific heat, thermal diffusivity, density, and calculated thermal conductivity have been determined for a modified acid bath electroless nickel-12.7 wt% phosphorus alloy between 298 ad 423 K. Thermal conductivity values are about half those of pure nickel.

DE82014570 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Review of Recent Irradiation-Creep Results.
W. A. Coghlan. May 82, 40p ORNL-5844
Contract W-7405-ENG-26
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Materials deform faster under stress in the presence of irradiation by a process known as irradiation creep. This phenomenon is important to reactor design and has been the subject of a large number of experimental and theoretical investigations. The purpose of this work is to review the recent experimental results to obtain a summary of these results and to determine those research areas that require additional information. The investigations have been classified into four subgroups based on the different experimental methods used. These four are: (1) irradiation creep using stress relaxation methods, (2) creep measurements using pressurized tubes, (3) irradiation creep from constant applied load, and (4) irradiation creep experiments using accelerated particles. The similarity and the differences of the results from these methods are discussed and a summary of important results and suggested areas for research is presented. In brief, the important results relate to the dependence of creep on swelling, temperature, stress state and alloying additions. In each of these areas new results have been presented and new questions have arisen which require further research to answer. 65 references. (ERA citation 07:044176)

DE82750254 MF **A01**
Bundesministerium fuer Forschung und Technologie, Bonn-Bad Godesberg (Germany, F.R.).
Influence of Fabricating Conditions and Stability of Austenite on Forming Behaviour of Austenitic Stainless Steels.
W. Kueppers. Nov 81, 89p BMFT-FB-T-81-192
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The object of the investigation is the effect of various conditions of cold rolling austenitic stainless steels on the mechanical and technological properties and on the behaviour during forming with requirements in stretching and deep drawing. Fabricating 3 coils of various stability of austenite the degree of cold forming between the annealing processes is varied by cold rolling from the thickness of hot rolled coil to final thickness without or with one or two intermediate annealings. The most important results for cold forming sheets are: most favourable stretch forming behaviour is gained with instable austenitic steels, becomes better with increasing sheet thickness most favourable deep drawing behaviour is gained with highest degrees of cold rolling before final annealing, is undependent from the stability of austenite. Favourable is cold rolling to the highest degree before intermediate annealing, whilst the deformation before final annealing is of greater importance. According to the results conditions can be given for cold rolling to get best forming behaviour. (ERA citation 07:044137)

DE82750255 MF **A01**
GKSS - Forschungszentrum Geesthacht G.m.b.H., Geesthacht-Tesperhude (Germany, F.R.)
Effects of Reactor Irradiation on Hydrogen Diffusion in alpha -Zirconium.
H. Morikawa. Jan 81, 81p GKSS-81/E/8
In German.Thesis.
U.S. Sales Only. Available in microfiche only.

The diffusion coefficient of hydrogen in alpha -Zirconium has been determined in the temperature range of 380 to 450 exp 0 C both for irradiated and unirradiated specimens. The fast neutron flux varied between (E > 1 MeV). Neutron irradiation at 380 exp 0 C caused a decrease of the effective diffusion coefficient by about 20%. At higher temperatures no influence of irradiation on the H-diffusion could be found. The retardation of H-diffusion at 380 exp 0 C has been explained by hydrogen trapping at vacancies produced by irradiation. Calculations bases on this model show that about 30% of H-atoms dissolved were trapped initially and only 70% were available for the hydrogen diffusion during irradiation. (ERA citation 07:044155)

DE82903123 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ciclo del Combustibile.
In-Pile Creep Rate of an Austenitic Steel Clad in PEC Geometry.
G. Filacchioni. Dec 80, 54p CNEN-RT/ING-(80)28
In Italian.
U.S. Sales Only. Available in microfiche only.

An irradiation experiment carried out in Siloe reactor is described. The purpose of this experiment is the study of in-pile creep-rate of a cold-worked clad under uniaxial tension. The results of the irradiation have been critically revised and some final conclusions are reported. (ERA citation 07:044141)

N82-29424/0 PC **A07**/MF **A01**
Advanced Research and Applications Corp., Sunnyvale, CA.
The Relative Stress-Corrosion-Cracking Susceptibility of Candidate Aluminum-Lithium Alloys for Aerospace Applications.
Final Report.
P. P. Pizzo. Jun 82, 128p NASA-CR-3578, NAS 1.26:3578
Contract NAS2-10365

Stress corrosion tests of Al-Li-Cu powder metallurgy alloys are described. Alloys investigated were Al-2.6%

Li-1.4% and Al-2.6% Li-1.4% Cu-1.6% Mg. The base properties of the alloys were characterized. Process, heat treatment, and size/orientational effects on the tensile and fracture behavior were investigated. Metallurgical and electrochemical conditions are identified which provide reproducible and controlled parameters for stress corrosion evaluation. Preliminary stress corrosion test results are reported. Both Al-Li-Cu alloys appear more susceptible to stress corrosion crack initiation than 7075-T6 aluminum, with the magnesium bearing alloy being the most susceptible. Tests to determine the threshold stress intensity for the base and magnesium bearing alloys are underway. Twelve each, bolt loaded DCB type specimens are under test (120 days) and limited crack growth in these precracked specimens has been observed. General corrosion in the aqueous sodium chloride environment is thought to be obscuring results through crack tip blunting.

N82-29435/6 PC **A04**/MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Optimization of Phase Analysis of Refractory Alloys in the Gas-Ion-Reaction Chamber.
H. J. Blumenkamp, H. Hoven, K. Koizlik, and H. Nickel. Apr 80, 67p JUEL-1654, ISSN-0366-0885
Text in German.

Refractory alloys were investigated by metallography, which is an independent group of characterization procedures as well as basis for many other methods. Reactor components outside the core which are under high thermal and mechanical stresses are made from refractory alloys. The material yield by metallography is the expansions of phase contrast, in particular the phase contrasting in the gas-ion-reaction chamber. The experimental procedure is described and the optimization of the procedure with the Ni and Fe-based refractory alloys examined in the IRW is discussed.

N82-29443/0 PC **A05**/MF **A01**
Technische Hogeschool Twente, Enschede (Netherlands).
Fim-Atom Probe Investigation of the Bainite Transformation in a Cr Mo Steel.
Ph.D. Thesis.
P. W. Bach. 2 Jul 81, 100p DE82-780187, INIS-MF-6830
Sponsored by the Nederlandse Organisatie voor Zuiver Wetenschappelijk Onderzoek.

To obtain a better understanding of the role played by Cr and Mo in the bainite transformation a Field-Ion Microscope - Atom Probe was constructed in order to study the distribution of the alloying elements near various types of boundaries on atomic scale. The distribution of alloying elements measured with this instrument is not so smooth on atomic scale as suggested by microprobe analysis. In a coherent twin boundary, formed during the bainite transformation, a depletion of the substitutionals Cr and Mo and an enhancement of the C content is observed, which is in accordance with the atomic model of a B.C.C. twin. In the twin plane the interstitial sites are even larger than the F.C.C. octahedral sites and this plane can act as an effective sink for the carbon atoms from bainitic ferrite. The depletion of Cr and Mo from the twin plane is due to interface coherency.

PB82-257916 PC **A04**/MF **A01**
Council for Mineral Technology, Randburg (South Africa).
Factors Affecting the Production of Fines During the Screening and Handling of High-Carbon Ferromanganese,
D. D. Howat, D. P. Enright, and H. Paulsen. 7 May 82, 54p MINTEK-M13

This investigation was undertaken in an attempt to determine the factors responsible for the high proportion of fines obtained in normal plant operation, and to develop procedures to minimize the production of fines. Part I describes the testwork that showed rapid cooling of the alloy and marked temperature gradients within the cooling slab of cast alloy to be the prime causes of the problem. Cooling of the top of the slab by water sprays seriously aggravated the problem. In addition, it was clearly demonstrated that, when 'layer casting' was practiced, the rapid reheating of the lower layer (which occurred when the molten alloy was poured onto it) resulted in serious shattering, giving a high proportion of fines. Part II includes an account of work done on a type of mold that had been proposed for use in a continuous casting machine.

PB82-259730 PC **A04**/MF **A01**
National Research Inst. for Metals, Tokyo (Japan).
Transactions of National Research Institute for Metals, Volume 24, Number 1, 1982.
1982, 72p
Also pub. in ISSN-0453-9222.

Contents: Macroscopic and microscopic processes in the delayed fracture crack growth of high strength steels; Production of high density W-Cr sintered alloys and their oxidation behavior; Effect of palladium addition on the oxidation characteristics of W-Cr sintered alloys; Effect of Ni on transformation behavior of synthetic weld heat-affected zone of steel; Estimation and consideration of cooling time to low temperatures of thermal cycle produced by preheating with a gas flame and arc welding; Effects of specimen size and test frequency on fatigue properties of SM50B butt welded joints--progress of NRIM fatigue data sheet work on welded joints, 1st report.

PB82-260985 PC **A02**/MF **A01**
Bureau of Mines, Reno, NV. Reno Research Center.
Operation of a Mineral Recovery Unit on Brine from the Salton Sea Known Geothermal Resource Area.
Rept. of investigations/1982,
L. E. Schultze, and D. J. Bauer. Jul 82, 18p
BUMINES-RI-8680

The Bureau of Mines operated a mineral recovery unit to recover metal values from post-flash geothermal brines from the Salton Sea known geothermal resource area as part of its research into the use of plentiful resources. The brine was available for metals recovery after its heat content had been used to generate electricity. The brine source was treated with lime to precipitate the contained iron, manganese, lead, and zinc before injection of the heat-depleted brine into the underground reservoir. Data are presented on the effects of process variables, such as rate and method of lime addition and air oxidation versus air exclusion. Variations in precipitation of metal values, composition of precipitates, effectiveness of slurry thickeners, and methods of treating the precipitates to recover metal values are discussed.

PB82-261496 Not available NTIS
National Bureau of Standards, Washington, DC.
Development of Analytical Fracture Mechanics Models for Surface Defects in Ductile Metals.
Final rept.,
Roland de Wit, and John H. Smith. Jun 80, 26p
Contract DOT-AS-800
Pub. in Proceedings of International Symposia on Continuum Models of Discrete Systems (3rd), Frendenstadt, Germany, June 24-30, 1980, p865-890.

Fracture mechanics methods have been used to provide a basis for assessing the significance of defects in pipeline girth welds. Analytical models based on fracture mechanics technology are developed to establish predicted critical defect sizes for sharp defects in plates of ductile metal. The general problem considered here is that of a surface defect in a plate under tension. Both infinite and finite width plates are treated. Failure is considered to occur when the ligament ruptures. The fracture mechanics model used, called the collapsed ligament model, is based on the work of Erdogan and Bakioglu which is in turn based on the Dugdale model. The collapsed ligament model assumes plastic collapse in the depth direction, but any fracture mechanics model in the length direction. Curves are derived for the expected predicted critical defect sizes, in which the defect depth is plotted versus the defect length for a given set of material properties and applied stress. Given a particular defect, if the point falls below the curve, the defect is safe, but if the point falls above the curve, failure is predicted.

PB82-261892 Not available NTIS
National Bureau of Standards, Washington, DC.
Corrosion and Corrosion-Fatigue Behavior of Ti-4.5A1-5Mo-1.5Cr (Corona 5) and Ti-6A1-4V.
Final rept.,
A. C. Fraker, M. A. Imam, K. M. Speck, and C. M. Gilmore. 1980, 10p
Pub. in Proceedings of International Conference on Titanium (4th), Kyoto, Japan, May 19-22, 1980, Titanium'80, p2595-2604.

This paper investigates the alloys, Ti-6Al-4V and Ti-4.5Al-5Mo-1.5Cr in terms of the microstructure and the corrosion-fatigue and general electrochemical behavior in saline solutions. Results show that the anodic polarization behavior in the passive range is quite similar for both alloys and both are highly corrosion resistant to saline solutions. Fatigue data show that at lower strain levels, the Ti-4.5Al-5Mo-1.5Cr alloy has a longer corrosion-fatigue life than the mill annealed Ti-6Al-4V while the opposite is true for higher strains.

PB82-262775 PC **A02**/MF **A01**
Bureau of Mines, Salt Lake City, UT. Salt Lake City Research Center.
Hydrometallurgical Treatment of Arsenic-Containing Lead-Smelter Flue Dust.
Rept. of investigations/1982,
F. A. Bloom, J. H. Maysilles, and H. Dolezal. Jul 82, 18p BUMINES-RI-8679

The Bureau of Mines investigated a process to make environmentally acceptable the discard of arsenic obtained from the treatment of arsenical flue dust. The process includes (1) leaching arsenic from a lead smelter copper dross flue dust, (2) fixing arsenic as an insoluble compound, and (3) recovering other metal values. Overall results of acid-leaching tests on lead-smelter flue dusts showed that H_2SO_4 dissolved 80 to 90 percent of the As, Zn, and Cd, and up to 86 percent of the In. Pb, Ag, and Au remain in the residue, which can be recycled to the smelter. Indium was recovered from the strong acid leach solution by solvent extraction; arsenic was fixed in a stable form by precipitation with $Fe_2(SO_4)_3$ and CaO or $CaCO_3$.

PB82-264367 Not available NTIS
National Bureau of Standards, Washington, DC.
Dry Sliding Wear Studies of Nickel-Phosphorus and Chromium Coatings on 0-2 Tool Steel.
Final rept.,
A. W. Ruff, and D. S. Lashmore. 1982, 23p
Pub. in American Society for Testing and Materials Special Technical Publication 769, p134-156 1982.

An investigation of the dry sliding wear behavior of electrodeposited nickel-phosphorous and chromium coatings on 0-2 tool steel has been carried out. Wear and friction measurements were made on the materials in an argon atmosphere under dry sliding conditions at 0.2 m/s sliding speed and a load of 10N. Among the materials studied, significant differences in wear rates were found which depended upon the nature of the coating. This work has determined the wear rates and has examined factors involved in the wear process for nickel alloy and chromium coatings produced using electroless, direct current and pulsed current plating techniques.

PB82-811415 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Superalloys. 1977-July, 1982 (Citations from the NTIS Data Base).
Sep 82, 273p
Supersedes PB81-807141 and PB80-805831.

Federally-funded research on cobalt- and nickel-based superalloys is cited. Casting and powder metallurgy of these alloys are covered. Properties such as heat resistance, corrosion resistance, microstructure, fracture, and creep are described. The use of these materials in nuclear reactors, gas turbine parts, and high temperature equipment is a major part of this compilation. (This updated bibliography contains 264 citations, 39 of which are new entries to the previous edition.)

PB82-811423 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Superalloys. 1979-March, 1981 (Citations from the Engineering Index Data Base).
Sep 82, 251p

Worldwide research is cited on cobalt-, iron-, and nickel-based superalloys. The manufacture, melting, casting, powder metallurgy, forging, and welding of these alloys are covered. Studies on corrosion, high and low temperature properties, physical, and mechanical properties of these materials are included. Applications discussed include nuclear reactors, gas turbines, superconducting machinery, and heat exchangers. (This updated bibliography contains 242 ci-

tations none of which are new entries to the previous edition.)

PB82-811431 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Superalloys. April, 1981-July, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 173p
Supersedes PB81-307158 and PB80-805856.

Worldwide research is cited on cobalt-, iron-, and nickel-based superalloys. The manufacture, melting, casting, powder metallurgy, forging, and welding of these alloys are covered. Studies on corrosion, high and low temperature properties, physical, and mechanical properties of these materials are included. Applications discussed include nuclear reactors, gas turbines, superconducting machinery, and heat exchangers. (This updated bibliography contains 164 citations, all of which are new entries to the previous edition.)

PB82-875253 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Abrasive Wear of Hard Metals. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 198p
Supersedes PB82-853383.

This bibliography contains citations concerning the results of abrasive wear tests performed on a variety of ferrous and nonferrous hard metals. Microstructure on abrasive wear is included relative to SEM and X-ray diffraction observation and analysis of such materials as iron, nickel, and cobalt base alloys; titanium; austenitic steels; plain carbon steels; and hard pure metals. Abrasive grains include diamond, black SIC, regular alumina, ruby alumina, monocrystalline alumina, 25 percent zirconia, garnet, quartz, calcite, and boron. (This updated bibliography contains 186 citations, 37 of which are new entries to the previous edition.)

PB82-875394 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Silver-Palladium Alloys. 1971-September, 1982 (Citations from the Metals Abstracts Data Base).
Rept. for 1971-Sep 82.
Sep 82, 60p
Supersedes PB81-863235.

This bibliography contains citations concerning silver palladium alloy characteristics. Physical properties are presented including emphasis on surface and electrical properties relative to electrical resistivity and surface corrosion of electrical contacts. Preparation of thin-films for optical devices is also discussed. (This updated bibliography contains 71 citations, 12 of which are new entries to the previous edition.)

PB82-875410 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aluminum-Four Percent Copper Alloys: Mechanical and Metallurgical Properties. 1966-September, 1982 (Citations from the Metals Abstracts Data Base).
Rept. for 1966-Sep 82.
Sep 82, 195p
Supersedes PB81-861007.

This bibliography contains citations concerning the properties of aluminum-4% copper alloy. Emphasis is placed on metallurgical properties such as aging, precipitation and structural hardening, corrosion, and stress-strain relationships. Metal fatigue and stress corrosion cracking of this alloy are included. (This updated bibliography contains 250 citations, 46 of which are new entries to the previous edition.)

PB82-875691 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Recycling Metal Scrap. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 114p
Supersedes PB80-856156.

This bibliography contains citations concerning the processes, techniques, and benefits of recycling metal scrap. Topics include an analysis of the current global metal recycling trends. (This updated bibliography contains 123 citations, 75 of which are new entries to the previous edition.)

PB82-875824 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Corrosion of Carbon Steels. 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Sep 82.
Sep 82, 95p
Supersedes PB81-852782.

This bibliography contains citations concerning carbon steel corrosion, including corrosion inhibition, effects of tensile stress, metal cleaning and passivation techniques. The effects of corrosive agents, including hydrogen sulfide, acid solutions, and chloride ions are also discussed. (This updated bibliography contains 90 citations, 13 of which are new entries to the previous edition.)

PB82-876137 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Temperature Sulfidation of Nickel and Nickel Alloys. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 159p
Supersedes PB81-853145.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning high temperature corrosion of nickel and nickel base superalloys. The attack of these metals due to the formation of low melting metal sulfides, the mechanisms of sulfidation, and measures to minimize corrosion are considered. Applications include gas turbines, high temperature fuel cells, coal conversion systems, and fiber reinforced coatings for corrosion protection. (This updated bibliography contains 134 citations, 59 of which are new entries to the previous edition.)

PB82-876277 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
High Temperature Sulfidation of Iron and Iron Alloys. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 123p
Supersedes PB81-853186.

This bibliography contains citations concerning the high temperature corrosion of iron and iron alloys. The effects of sulfur containing fuels on the sulfidation process are considered as they relate to corrosion in gas turbines, coal gasification, and fluidized bed processors. Changes in both physical and metallurgical properties due to sulfidation are also considered. The use of additives to reduce the sulfidation process is also included. (This updated bibliography contains 83 citations, 33 of which are new entries to the previous edition.)

PB82-876319 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aluminum Castings. 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Sep 82.
Sep 82, 253p
Supersedes PB81-854804.

This bibliography contains citations concerning casting of aluminum and aluminum alloys. Included are citations on molds, pouring temperature and metallurgical influences of inclusions and alloying. Many citations pertain to the properties of aluminum castings, such as tensile strength, shrinkage, porosity, ductility, and machinability. A few citations relate to applications of such castings, including structural forms, frames, wheels, and engines. (This updated bibliography contains 284 citations, 85 of which are new entries to the previous edition.)

PB82-876343 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nickel Ore Treatment. 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Sep 82.
Sep 82, 193p
Supersedes PB81-864548.

This bibliography contains citations concerning the treatment of nickel containing ore, with emphasis on the separation of other metals commonly found in nickel ores. Hydrometallurgical processes employing solvent extraction and complexing agents are also considered. (This updated bibliography contains 216 citations, 27 of which are new entries to the previous edition.)

11G. Miscellaneous Materials

N82-29457/0 PC **A03**/MF **A01**
Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
Improvements in Waterproofing Membranes by Modifying Bitumen with Thermoplastic Polymer.
S. Piazza, A. Arcozzi, F. Balestrazzi, C. Verga, and S. D. Milanese. 1982, 50p NRC/CNR-TT-2011, ISSN-0077-5606
Transl. into English from Poliplasti (Italy), V. 27, No. 257, 1979 p 91-102.

Waterproofing of roofs with impermeable membranes based on bitumen modified with high modulus materials is widely employed. The mechanical and viscoelastic behavior of bitumen, either at low or at high temperatures, are appreciably improved by addition of thermoplastic polymers such as styrene-butadiene-styrene rubbers and atactic polypropylene. Such materials exhibit a complementary use but to obtain the optimum properties it is necessary that compatible bitumens be used and that a proper mixing of the bitumen and thermoplastic polymers be achieved.

PB82-261710 Not available NTIS
National Bureau of Standards, Washington, DC.
Electrical Conductivity Measurements on Mixed Ionic/Electronic Conducting Materials at High Temperatures.
Final rept.,
W. R. Hosler. 1981, 6p
Pub. in Proceedings of Symposium on Thermophysical Properties (8th), National Bureau of Standards, Gaithersburg, MD, June 15-18, 1981, p138-143.

Measurements of the physical properties of materials at high temperatures are becoming increasingly important particularly with respect to emerging energy technologies. A technique has been developed for the measurement of the electrical conductivity of some of the materials which are particularly difficult to handle. Contacts are made to the sample by using spongy platinum peened around the leads in holes drilled in the sample. For those samples that become liquid at some temperature during the course of the measurement, a leak-tight seal is made in the crucible using spongy platinum compressed around the leadout through the crucible. Measurements on coal slag are described. Four probe DC and AC (40Hz to 40KHz) measurements were made on the sample and the resulting conductivities are in good agreement. Additional voltage data were obtained on all probe sets. The differences between these AC and DC voltages developed on the various probe sets give an indication of the contribution of ionic conductivity.

PB82-875386 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Photochromic Materials. June, 1976-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 76-Sep 82.
Sep 82, 154p
Supersedes PB80-851223.

This bibliography contains citations concerning photochromic material technology. Optical equipment and systems, imaging and display systems, and photochromic storage and retrieval systems are among the applications presented. Properties and performance tests are also included. (This updated bibliography contains

119 citations, 42 of which are new entries to the previous edition.)

PB82-876251 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Photochromic Materials. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 169p
Supersedes PB80-851231.

This bibliography contains citations concerning photochromism and photochromic material technology. Studies and properties of photochromic glasses as well as photochromic polymers and other organic compounds, films, and ceramics are included. Photochromic materials for use in optical data storage are also included. (This updated bibliography contains 180 citations, 40 of which are new entries to the previous edition.)

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A118 445/6 PC **A03**/MF **A01**
Monsanto Research Corp., Dayton, OH. Dayton Lab.
Colorimetric Oil Analysis for Titanium.
Final rept. 13 Jul-30 Sep 81,
William J. Hillan, Mark T. Wininger, and William D. Ross. Mar 82, 35p MRC-DA-1101, AFWAL-TR-81-2138
Contract F33615-81-C-2073

The goal of this research contract was to develop a rapid flight-line method compatible with the Colorimetric Iron Kit for assessing the titanium content in used jet engine lubricating oil. A colorimetric method capable of analyzing for up to 20 ppm titanium was developed for this purpose. The method extracts the titanium from the oil into an aqueous phase where it is complexed with TIRON to form a yellow color indicative of the titanium concentration. The titanium concentration can be quantitated by measuring the yellow aqueous layer with a spectrophotometer or colorimeter at 400 micrometers. (Author)

AD-A118 477/9 PC **A06**/MF **A01**
Martin Marietta Aerospace, Denver, CO. Denver Div.
Oil Wearmetal Analysis by X-Ray (OWAX).
Final rept. 1 Sep 80-15 Feb 82,
B. C. Clark, and B. J. Cook. May 82, 125p MRC-82-509, AFWAL-TR-82-2020
Contracts F33615-80-C-2071, MIPR-FD2050-80-68046

A detailed feasibility study has been completed for application of the technique of x-ray fluorescence spectrometry to the analysis of wear metals in aircraft engine lubricants. Through laboratory experimentation, the relative values of various excitation methods, sample treatments, and sensor systems have been established. The recommended approach is based upon the modification of an existing portable x-ray analyzer to include a high-intensity x-ray excitation source, sample filtration, and a small computer for data analysis, display, and storage.

AD-A118 555/2 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mechanical Engineering, Aeronautical Engineering and Mechanics.
Alignment of Fluid Molecules in an EHD Contact,
James L. Lauer, Leonhard E. Keller, Frank H. Choi, and Vincent W. King. 1981, 10p AFOSR-TR-82-0627
Grants AFOSR-78-3473, NSG-3170
Pub. in ASLE Transactions, v25 n3 p329-336 1981.

No abstract available.

AD-A118 573/5 PC **A05**/MF **A01**
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
Characterization and Evaluation of Re-Refined Engine Lubricating Oil.
Interim rept. Oct 79-Sep 81,
Edwin A. Frame, and Karen B. Kohl. Dec 81, 90p
Rept nos. AFLRL-152, SWRI-6800-299
Contracts DAAK70-80-C-0001, DAAK70-82-C-0001

This program was conducted to obtain additional data base on the comparative performance of re-refined and virgin oils and to investigate the potential 'substantial equivalence' of re-refined and virgin lubricating oils. The program consisted of: (1) the development of an engine deposit removal, recovery, and analysis methodology. This methodology was used to compare engine deposits derived from virgin and re-refined engine oils. (2) The effects of virgin and re-refined oils on engine blowby composition and engine deposit generation were determined using a spark ignition engine and, (3) Virgin and re-refined basestock production consistency were determined by participating in the ASTM/NBS cooperative basestock consistency study. (Author)

DE82012254 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Oxidative Stability of Deuterated Lubricants.
Jan 82, 39p DOE/ER/10168-T1, GC-TR-82-182
Contract AI01-80ER10168

The extremely positive results of the three areas of investigation - bearing tests, determination of oxidative stability, and economic studies - emphasize the value of continued research into deuterated lubricants. The bearing tests not only confirmed results previously reported by NADC, but, since the tests were run over a wider range of temperatures and under more stringent specifications, show even more impressive promise for deuterated lubricants. The stability measurements demonstrated a factor of three to twenty improvement of deuterated compounds over their hydrogenated counterparts, and the economic analysis indicates that, even at current prices for compounds, the potential benefits in a number of applications are great.

N82-29458/8 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Boundary Lubrication: Revisited.
W. R. Jones, Jr.. 1982, 33p NASA-TM-82858, E-1181
Presented at Meeting of the AM. Soc. Of Lubrication Engr., Independence, Ohio, 9 Mar. 1982.

A review of the various lubrication regimes, with particular, emphasis on boundary lubrication, is presented. The types of wear debris and extent of surface damage is illustrated for each regime. The role of boundary surface films along with their modes of formation and important physical properties are discussed. In addition, the effects of various operating parameters on friction and wear in the boundary lubrication regime are considered.

PB82-258922 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC.
Investigation of the Lubrication Mechanisms of the Complex Metal Sulfide, SbSbS4.
Annual rept. 1 Oct 80-30 Sep 81,
L. K. Ives, M. B. Peterson, J. S. Harris, P. A. Boyer, and A. W. Ruff. Jul 82, 75p NBSIR-82-2545-ONR
Contract N00014-80-F-0031

Studies have been carried out to determine certain basic properties of the complex metal sulfide, SbSbS4, that pertain to its use as a solid lubricant and lubricant additive material. The research verified the performance under EP conditions as an additive to a base grease. However the performance of SbSbS4 as a solid lubricant (in the form of a powder) was not found to be effective at temperatures below about 225C. It was noted though that, when used as a dry powder lubricant, the compound did produce a thick adherent film on steel surfaces in sliding contact. Six different types of wear and friction tests were carried out under various conditions of load, sliding speed, contact geometry, temperature, and time, in order to fully explore the potential of SbSbS4 as a lubricant on several different metals.

PB82-875550 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Lubricants for Sliding Contacts. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 159p
Supersedes PB82-854340.

This bibliography contains citations concerning the behavior and properties of sliding and sliding-rolling contact lubricants. Lubrication mechanism descriptions, and mechanical component failure reduction for specific contacts are considered. Lubricant performance evaluations are included. (This updated bibliography contains 127 citations, 76 of which are new entries to the previous edition.)

11I. Plastics

AD-A118 661/8 Not available NTIS
McGill Univ., Montreal (Quebec). Dept. of Chemistry.
Dynamic Mechanical Properties of Sulfonated Cyclized cis-1,4-Polyisoprene,
Zheng Long Zhou, and A. Eisenberg. 23 Jun 81, 16p ARO-17436.3-CH
Contract DAAG29-80-C-0144
Availability: Pub. in the Jnl. of Applied Polymer Science, v27 p657-671 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 714/5 PC **A06**/MF **A01**
Honeywell, Inc., Hopkins, MN. Defense Systems Div.
Evaluation Selection of Encapsulating Plastics for Ordnance Electronic Assemblies.
Final rept. 8 Jan 79-30 Apr 80,
Stephen J. Price, R. E. Isliefson, R. J. Ryan, and Allan Goldberg. May 81, 125p 41735, HDL-CR-81-017-1
Contract DAAK21-79-C-0017

A program was conducted to evaluate new plastics for encapsulating ordnance electronic circuits. Various candidate plastics including foams, syntactic resins, filled systems, semirigids, elastomers and molded thermoplastics and thermosets were evaluated through extensive mechanical and environmental tests followed by encapsulation of test circuits. Additionally, a relative cost comparison of the various material categories was conducted to identify and quantify cost drivers.

PB82-811498 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Polytetrafluoroethylene. 1979-August, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 189p
Supersedes PB81-806259 and PB80-806698.

The bibliography contains citations of worldwide research on polytetrafluoroethylene. References cover its reactions, properties, performance, and manufacturing. (This updated bibliography contains 182 citations, 63 of which are new entries to the previous edition.)

11J. Rubbers

DE82013856 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Cyclic-Stress-Strain Behavior of Rubber.
D. R. Lesuer, R. H. Cornell, and S. D. Santor. 12 Feb 82, 8p UCRL-86688, CONF-820516-10
Contract W-7405-ENG-48
Joint conference on experimental mechanics, Honolulu, HI, USA, 22 May 1982.

Rubber in general exhibits non-linear viscoelastic behavior. One manifestation of this non-linearity is a variation in the dynamic moduli with strain amplitude. However, a closer examination of the dependence of dynamic moduli on strain suggests that for engineering problems, a linear viscoelastic treatment may provide an adequate representation of the constitutive behavior of rubber, provided the moduli are evaluated at the strain range and loading frequency of interest. This presentation describes an experimental study into the suitability and limitations of a simple linear viscoelastic model used in several large deformation finite element computer codes. The procedure was to obtain the cyclic stress-strain behavior of a rubber suitable for use in a load bearing application and compare the results with the stress-strain response predicted by the

finite element code NIKE2D. This code was developed at Lawrence Livermore National Laboratory to study the finite strain response of solids subjected to axisymmetric or plane strain deformation. (ERA citation 07:044222)

11L. Wood and Paper Products

PATENT-4 343 095 Not available NTIS
Department of Agriculture, Washington, DC.
Pressure Dryer for Steam Seasoning Lumber.
Patent,
Howard N. Rosen, Robert E. Bodkin, and Kenneth D. Gaddis. Filed 24 Mar 81, patented 10 Aug 82, 8p
PB82-258021, PAT-APPL-6-246 971
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The patent describes a process and apparatus for accelerated drying of green and partially dried lumber at pressures above atmospheric pressure to rapidly remove selected portions of moisture from the wood without degradation of the wood structure. A kiln for performing the method comprises a generally cylindrical kiln chamber to contain a stack of lumber, a bypass line from the front to the back of the chamber to heat and distribute steam evenly to the lumber surfaces, a pressure-controlled steam vent to regulate kiln temperature, and temperature control to regulate the rate of drying.

PB82-261363 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Fate and Impact of Wood Preservatives in a Terrestrial Microcosm.
Journal article,
Jay D. Gile, James C. Collins, and James W. Gillett.
6 Dec 81, 9p EPA-600/J-82-218
Pub. in Jnl. of Agricultural and Food Chemistry,v30 n2 p295-210 Mar-Apr 82.

The transport and effects of 14C-labeled wood preservatives (creosote with labeled phenanthrene or acenaphthene, pentachlorophenol, and bis(tri-n-butyltin)oxide) impregnated in wood posts were examined in a terrestrial microcosm chamber (TMC-II) in comparison to a reference compound, the insecticide dieldrin. The TMC-II contained a Willamette Valley topsoil, ryegrass, invertebrates, and a gravid gray-tailed vole (Microtus canicaudus). Approximately 2.5 months after introduction of the posts, 95% of the chemicals remained in the post, 95% of the chemicals remained in the posts. Of the material released into the ecosystem, most remained in the upper soil layer immediately surrounding the posts. Concentrations in plants ranged from 0.7 ppm for dieldrin to 8.8 ppm for phenanthrene. Residue accumulation by the invertebrates was highly variable. Of the chemicals tested, creosote accumulated in the vole to the greatest extent (e.g., whole body concentrations of 7.2 and 37.0 ppm for phenanthrene and acenaphthene, respectively. Only dieldrin exhibited any acute toxic effects (e.g., cricket survival).

PB82-875634 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Anthraquinone Pulping. 1976-September, 1982 (Citations from the Paper and Board, Printing, and Packaging Industries Research Associations Data Base).
Rept. for 1976-Sep 82.
Sep 82, 188p
Supersedes PB81-875155.

This bibliography contains citations concerning anthraquinone pulping in which anthraquinone is utilized as a catalyst to promote delignification of pulpwood. Performance test results and investigation findings are cited to determine yield, pulp quality, delignification rate, paper machinability, economic analysis, adverse industrial effects, and bleaching capability of such wood fibers as spruce, beech, eucalyptus, pine and birch. Anthraquinone pulping is compared to, and contrasted with, kraft pulping and sulfate pulping. (This updated bibliography contains 140 citations, 49 of which are new entries to the previous edition.)

PB82-876160 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Microwaves Used in Bark and Paper Drying. 1973-September, 1982 (Citations from the Institute of Paper Chemistry Data Base).
Rept. for 1973-Sep 82.
Sep 82, 136p
Supersedes PB81-863789.

This bibliography contains citations concerning the uses of microwaves in the paper and pulp industries for drying and for measuring moisture in the bark and paper material. Drying by microwaves is applied to paperboards, paper webs, glues, printing inks, woodchips and pulp, and in some cases to special applications such as water-soaked library books. Measurement of moisture by microwaves is addressed from economic and technical standpoints. A few articles contain reports on the dielectric properties of paper, board, and cellulosic materials. (This updated bibliography contains 132 citations, 19 of which are new entries to the previous edition.)

PB82-876202 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Book Restoration and Preservation. 1972-September, 1982 (Citations from the Institute of Paper Chemistry Data Base).
Rept. for 1972-Sep 82.
Sep 82, 98p
Supersedes PB81-872764.

This bibliography contains citations concerning the techniques and methods used in the preservation and restoration of various types of books. Topics include discussions of the processes involved in the deacidification and drying of damaged books as well as of coatings and additives for the prevention of biodeterioration, fungal growth, and other microorganism attacks. (This updated bibliography contains 91 citations, 41 of which are new entries to the previous edition.)

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A118 501/6 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Statistics.
A Two-Stage Elimination Type Procedure for Selecting the Largest of Several Normal Means with a Common Unknown Variance.
Technical rept.,
Shanti S. Gupta, and Woo-Chul Kim. Aug 82, 34p
Rept no. TR-82-27
Contract N00014-75-C-0455

The problem of selecting the normal population with the largest mean from several populations with common unknown variance is considered. A new simple two-stage elimination type procedure is proposed which guarantees the same probability requirement using the indifference-zone approach as does the two-stage non-elimination type procedure of Bechhofer, Dunnett and Sobel (1954). The observations in the first stage are used not only to estimate the common unknown variance but also to screen out non-contending populations.

AD-A118 534/7 PC **A02**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering.
Research in Adaptive Control - Hybrid and Constrained Structure Systems.
Annual technical rept. no. 2, 1 May 81-30 Apr 82,
T. E. Djaferis, and R. V. Monopoli. 30 Jun 82, 7p
AFOSR-TR-82-0638
Grant AFOSR-80-0155

Research results in Hybrid Model Reference Adaptive Control Systems (HMRACS) are reported. Two stable hybrid adaptive algorithms are given for gain adjustment with periodic or variable rate sampling. The hybrid approach holds promise for more robust designs in the presence of unmodelled dynamics. New pole assignment methods using dynamic output feedback are discussed that improve earlier results and which may in addition lead to simpler adaptive algorithms. (Author)

AD-A118 535/4 PC **A02**/MF **A01**
Stanford Univ., CA. Dept. of Computer Science.
An Algorithm for Reducing Acyclic Hypergraphs.
Technical rept.,
Gabriel M. Kuper. Jan 82, 11p STAN-CS-82-892,
AFOSR-TR-82-0646
Grant AFOSR-80-0212

The report gives a description of an algorithm to compute efficiently the Graham reduction of an acyclic hypergraph with sacred nodes. To apply the algorithm we must already have a tree representation of the hypergraphs, and therefore it is useful when we have a fixed hypergraph and wish to compute Graham reductions many times, as we do in the System/U query interpretation algorithm. (Author)

AD-A118 547/9 PC **A02**/MF **A01**
Mississippi State Univ., Mississippi State. Dept. of Aerophysics and Aerospace Engineering.
A Noniterative Method for the Generation of Orthogonal Coordinates in Doubly-Connected Regions.
Technical rept.,
Z. U. A. Warsi, and J. F. Thompson. 10 Nov 80, 18p
AFOSR-TR-82-0644
Grants AFOSR-80-0185, AFOSR-76-2922
Pub. in Mathematics and Computation, v38 n158 p501-516 Apr 82.

No abstract available.

AD-A118 548/7 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. Dept. of Statistics.
On Isotonic Selection Rules for Binomial Populations Better than a Standard.
Technical rept.,
Shanti S. Gupta, and Wen-Tao Huang. Jul 82, 28p
Rept no. TR-82-22
Contract N00014-75-C-0455

The problem of selecting populations better than a control with respect to a location parameter under ordering prior has been considered. In this paper we consider the case of binomial populations (important for discrete data) for which the parameters of interest are not the location parameters as was the case studied in 4. We consider both cases when the parameter of control is known and unknown. For the case of known control, we propose an isotonic procedure which is given. The results in this section deal with both cases, namely, the sample sizes all equal, and unequal. Some recursive relations are derived for computing the constants required for the proposed procedure. When the control is unknown, a conditional isotonic procedure is proposed. This procedure provides a conservative solution for the unconditional procedure. Brief tables of associated constants for the proposed procedures are given.

AD-A118 549/5 PC **A02**/MF **A01**
Maryland Univ., College Park. Dept. of Management and Statistics.
Detection of Faulty Inspection.
Technical rept.,
Norman L. Johnson, and Samuel Kotz. Aug 82, 13p
Contract N00014-81-K-0301, Grant NSF-MCS-8-21704

Some heuristic tests for detection of existence of errors in inspection are proposed. Some of these tests are only effective if the sampling function ((sample size)/(lot size)) is rather large, and in all cases their application predicates special experiments to provide the requisite data. Feasibility or these experiments will

vary according to specific circumstances. Estimation of the probability of detection is discussed. (Author)

AD-A118 562/8 Not available NTIS
Yale Univ., New Haven, CT. Dept. of Computer Science.
Algorithms and Data Structures for Sparse Symmetric Gaussian Elimination,
Stanley C. Eisenstat, Martin H. Schultz, and Andrew H. Sherman. 31 Mar 80, 13p
Contracts N00014-76-C-0277, F49620-77-C-0037
Prepared in cooperation with Texas Univ. at Austin. Dept. of Computer Science.
Availability: Pub. in SIAM Jnl. of Sci. Stat. Comput. v2 n2 p225-237 Jun 81 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 598/2 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
The Selection of Smoothness Priors for Distributed Lag Estimation.
Technical summary rept.,
Hirotugu Akaike. Jun 82, 17p Rept no. MRC-TSR-2394
Contract DAAG29-80-C-0041

In the application of Shiller's smoothness prior for distributed lag estimation the main difficulty is the selection of hyperparameters of the prior distribution. In this paper the use of a maximum likelihood procedure is proposed for this purpose and its performance is demonstrated by numerical examples.

AD-A118 599/0 PC **A03**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Lower Bounds for the Life Span of Solutions of Nonlinear Wave Equations in Three Dimensions.
Technical summary rept.,
Fritz John. Jun 82, 42p Rept no. MRC-TSR-2393
Contracts N00014-76-C-0439, DAAG29-80-C-0041
Sponsored in part by Grant NSF-MCS79-00812.

No abstract available.

AD-A118 606/3 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Approximation Order from Bivariate C1-Cubics: A Counter Example.
Technical summary rept.,
C. de Boor, and K. Hoellig. Jun 82, 14p Rept no. MRC-TSR-2389
Contract DAAG29-80-C-0041, Grant NSF-MCS79-27062

It is shown that the space of bivariate C1 piecewise cubic functions on a hexagonal mesh of size h approximates to certain smooth functions only to within O(h3) even though it contains a local partition of every cubic polynomial. One measures the approximation power of a family S of piecewise polynomial approximating functions on some partition in terms of the meshsize h of that partition. Typically, the error of approximation goes to zero like hr as the meshsize goes to zero, with r depending on the smoothness of the function being approximated. There is a maximal r typical for the space S used, and faster convergence rates are possible only for very special functions. Naturally, one would like this optimal rate or approximation order hr to be as fast as possible, i.e., would like the maximal r to be as large as possible. In any case, it is an important practical question to ascertain, for a given approximating space S, what its optimal approximation order is.

AD-A118 607/1 PC **A03**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Some Properties of Viscosity Solutions of Hamilton-Jacobi Equations.
Technical summary rept.,
M. G. Crandall, L. C. Evans, and P. L. Lions. Jun 82, 31p Rept no. MRC-TSR-2390
Contract DAAG29-80-C-0041, Grant NSF-MCS81-02846

Recently M. G. Crandall and P. L. Lions introduced the notion of 'viscosity solutions' of scalar nonlinear first order partial differential equations. Viscosity solutions need not be differentiable anywhere and thus are not sensitive to the classical problem of the crossing of characteristics. The value of this concept is established by the fact that very general existence, uniqueness and continuous dependence results hold for viscosity solutions of many problems arising in fields of application. The notion of a 'viscosity solution' admits several equivalent formulations. Here we look more closely at two of these equivalent criteria and exhibit their virtues by both proving several new facts and reproving various known results in a simpler manner. Moreover, by forsaking technical generality we hereby provide a more congenial introduction to this subject than the original paper. (Author)

AD-A118 666/7 PC **A03**/MF **A01**
Portland State Univ., OR. Dept. of Psychology.
A Transformation Yielding an Additive Representation of Data in a Two-Way Array.
Technical rept.,
James A. Paulson. 15 Aug 80, 27p Rept no. TR-80-1
Contract N00014-79-C-0214

It is common practice when seeking an additive representation of data in a two-way array to try out various transformations using Tukey's single degree of freedom for nonadditivity as an index of the extent of the deviation of the reexpressed data from additivity. It is shown that when data fit Tukey's model and an additive representation exists in the sense defined by Luce and Tukey (1964), the transformation required to obtain the additive representation is f(y)=log (wavelength gamma + 1 - wavelength microns), where wavelength is the weight for the degree of freedom for nonadditivity. The transformation is unique up to a linear transformation. This result is in apparent conflict with power transformations suggested by Anscombe and Tukey (1963). (Author)

AD-A118 667/5 PC **A03**/MF **A01**
Portland State Univ., OR. Dept. of Psychology.
Empirical Bayes Estimation of Proportions in Several Groups.
Technical rept.,
James A. Paulson. Jan 81, 36p Rept no. TR-81-1
Contract N00014-79-C-0214

The problem of estimating binomial proportions in several similar but not necessarily identical groups occurs frequently in psychological and educational settings. A straightforward empirical Bayes approach to this problem using a slight extension of the standard Bayesian method for estimating a single proportion is proposed. Novick, Lewis, and Jackson (1973) suggest a purely Bayesian solution to the problem which uses a root arcsine transformation of the proportions. They contrast their method with a similar approach using the same transformation, due to Jackson (1972) using examples to show that the Bayesian approach is better. This note shows that an improved version of Jackson's approach yields much more satisfactory results than the original, so the advantage of the purely Bayesian approach is questionable. But the revised version of Jackson's approach and the new beta-binomial approach yield practically identical results, so even the need for using the root-arcsine transformation is questionable, except when the proportions are concentrated near zero or one.

DE82013692 PC **A03**/MF **A01**
Argonne National Lab., IL.
Newton's Method.
J. J. More, and D. C. Sorensen. Feb 82, 45p ANL-82-8
Contract W-31-109-ENG-38
Microfiche only after original copies are exhausted.

Newton's method plays a central role in the development of numerical techniques for optimization. In fact, most of the current practical methods for optimization can be viewed as variations on Newton's method. It is therefore important to understand Newton's method as an algorithm in its own right and as a key introduction to the most recent ideas in this area. One of the aims of this expository paper is to present and analyze two main approaches to Newton's method for unconstrained minimization: the line search approach and the trust region approach. The other aim is to present some of the recent developments in the optimization field which are related to Newton's method. In particular, we explore several variations on Newton's method which are appropriate for large scale problems, and we also show how quasi-Newton methods can be derived quite naturally from Newton's method.

DE82015239 PC **A07**/MF **A01**
General Atomic Co., San Diego, CA.
Application of a Floating Point Systems AP190L Array Processor to Finite Element Analysis.
R. C. Young. Apr 82, 135p GA-A-16719
Contract AT03-76ET35301

This report discusses the implementation of a finite element program on a Floating Point Systems AP190L array processor attached to a Univac 1182 host computer. The array processor was used to perform all calculations on the global system of linear equations including matrix assembly, matrix factoring and vector solution. A large scratch disk was attached directly to the array processor for storing the factored matrix. The remaining calculations, including data preparation, element matrix formation, stress integration and output display were performed by the host computer. (ERA citation 07:048907)

DE82750178 PC **A02**/MF **A01**
Bonn Univ. (Germany, F.R.). Physikalisches Inst.
Structure and Representations of the Symmetry Group of the Four-Dimensional Cube.
M. Baake, B. Gemuenden, and R. Oedingen. Jul 81, 25p BONN-HE-81-13
U.S. Sales Only.

In this paper we give, explicitly, the description of the structure, the characters, and the complete system of the hyperoctahedral group in four dimensions, which we call W sub 4 (from the German 'Wuerfel'). In a second step, we do the same for the subgroup SW sub 4 which is formed by all pure rotations contained in W sub 4 . (ERA citation 07:045238)

N82-29904/1 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Global Differential Geometry: An Introduction for Control Engineers.
B. F. Doolin, and C. F. Martin. Jun 82, 69p NASA-RP-1091, NAS 1.61:1091

The basic concepts and terminology of modern global differential geometry are discussed as an introduction to the Lie theory of differential equations and to the role of Grassmannians in control systems analysis. To reach these topics, the fundamental notions of manifolds, tangent spaces, vector fields, and Lie algebras are discussed and exemplified. An appendix reviews such concepts needed for vector calculus as open and closed sets, compactness, continuity, and derivative. Although the content is mathematical, this is not a mathematical treatise but rather a text for engineers to understand geometric and nonlinear control.

N82-29974/4 PC **A02**/MF **A01**
Moore School of Electrical Engineering, Philadelphia, PA.
Measurement Accuracies in Band-Limited Extrapolation.
H. N. Kritikos. Jul 82, 19p NASA-CR-169152, NAS 1.26:169152
Contract NAG5-92

The problem of numerical instability associated with extrapolation algorithms is addressed. An attempt is made to estimate the bounds for the acceptable errors and to place a ceiling on the measurement accuracy and computational accuracy needed for the extrapolation. It is shown that in band limited (or visible angle limited) extrapolation the larger effective aperture L' that can be realized from a finite aperture L by over sampling is a function of the accuracy of measurements. It is shown that for sampling in the interval L/b absolute value of xL, b1 the signal must be known within an error e sub N given by e sub N squared approximately = 1/4(2kL') cubed (e/8b L/L')(2kL') where L is the physical aperture, L' is the extrapolated aperture, and k = 2pi lambda.

N82-29987/6 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Numerical Generation of Orthonormal Polynomials of Many Variables.
V. Gadjokov. 1981, 17p DE82-700460, JINR-E-11-80-782
In English; Russian Summary.

An algorithm for the numerical generation of many-dimensional polynomials which are orthonormal with arbitrary weights over a finite real discrete point set is described. Orthonormalization of ordinary many-dimensional linearly-independent monomials is

achieved by means of recursion analogous to Forsythe three-term recurrence relation in the case of one dimension. Special attention is paid to the hierarchical order of polynomials obtained. The case of two dimensions is implemented in a package of FORTRAN-4 codes. A numerical example which permits analytical check is considered in detail, and two applications to the problem of data fitting by polynomial series are briefly reported.

N82-29989/2 PC **A23**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Advances in the Techniques and Technology of the Application of Nonlinear Filters and Kalman Filters.
C. T. Leondes. Mar 82, 531p AGARD-AG-256, ISBN-92-835-1418-1

No abstract available.

PB82-250853 CP **T05**
National Bureau of Standards, Washington, DC.
Legendre Function Programs.
Software,
John M. Smith, and R. M. McCabe. Jul 82, mag tape NBS/DF-82/004
Source tape is in ASCII character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

A source code is given for a test program and 15 subroutines, written in FORTRAN 77, which provide for the calculation of Legendre functions of the first kind of positive order of negative order, Legendre fuctions of the second kind of positive order, or normalized Legendre functions. These programs were written and tested on a UNIVAC 1100/80 computer using EXEC-8 operating system. Input and output is fully discussed in program comments and in the paper 'Associated Legendre Functions on the Cut,' submitted to the Journal of Computational Physics...Software Description: The system is written in the FORTRAN programming language for implementation on a UNIVAC 1100/80 computer using the EXEC-8, Level 37R2B operating system. 100K bytes of core storage are required to operate the system.

PB82-258385 PC **A03**/MF **A01**
National Earth Satellite Service, Washington, DC.
Numerical Smoothing and Differentiation by Finite Differences.
Technical rept.,
Henry E. Fleming, and Lawrence J. Crone. May 82, 32p NOAA-TR-NESS-91, NOAA-82072904

General formulae are derived for digital polynomial smoothing and digital polynomial differentiation of data observed at equal abscissa spacings. The operations are performed by a moving fit of polynomials to small overlapping subsets of the data. Results are also derived for the special situation in which the moving fit approaches the boundary of the data set. Brief discussions indicate how the formulae are applied in practical situations and include a description of an error detection and correction technique which is very closely related to smoothing.

PB82-262106 PC **A04**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Onderafdeling der Wiskunde en Informatica.
Analysis and Comparison of Relaxation Schemes in Robust Multigrid and Preconditioned Conjugate Gradient Methods, Extended Version,
Rob Kettler. 1982, 54p 82-17

A robust and efficient MG (Multigrid) method should incorporate both suitable transitions between fine and coarse grids and a good smoothing method. In a recent paper, the author presented an MG method based on incomplete Gauss elimination/continuity interpolation to cope with strong inhomogeneities and general domains. Further acceleration has been achieved by using the MG method as preconditioning for CG, the result being called MGCG. In addition, a robust smoothing method is required for problems with strong anisotropies. In this paper, several Gauss-Seidel and incomplete LU relaxation schemes are more extensively compared with respect to their smoothing factors and efficiencies. Besides, the practical behavior of some of these schemes is compared for three iterative methods (MG, MGCG and ICCG) and two difficult test problems (according to Stone and Kershaw).

PB82-262742 PC **A03**/MF **A01**
Instituut TNO voor Wiskunde, Informatieverwerking en Statistiek, The Hague (Netherlands).
The Biplot in Multivariate Analysis,
C. J. F. ter Braak. Jun 81, 29p

The relation is reviewed between biplots and the multivariate techniques principal component analysis, discriminant analysis, and canonical correlation analysis. The emphasis is on the graphical representation of multivariate data by bilinear approximation of matrices with weighted least-squares.

PB82-263443 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Normal Form and Representation Theory.
Final rept.,
Richard Cushman, Richard Mosak, and Andre Deprit. Jun 82, 73p NBSIR-82-2541

Representation theory of Lie algebras is called upon to develop a procedure for normalizing a dynamical system with two degrees of freedom in the neighborhood of an equilibrium when the Hamiltonian H(x, y, X, Y) in the coordinates (x, y) and their conjugate momenta (X, Y) is of the type H = ((X sup 2) + (Y sup 2))/2 + V(x, y, X, Y), the potential energy V being a sum of homogeneous polynomials in the phase variables of degree strictly greater than two. The fact that the resulting potential V' is a polynomial in the new coordinates (x', y') and the angular momentum G' = x' Y' - y' X' implies that the normalization is a rotation in the configuration space from a fixed frame to an ideal frame. The technique is intended for normalizing an Hamiltonian in equilibrium at the origin when the Lie derivative associated with the quadratic part is not semi-simple, e.g. the planar Restricted Problem of Three Bodies at the equilateral equilibrium L4 when the basic frequencies are equal (Routh's singular case).

12B. Operations Research

AD-A118 757/4 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
Convergence and Asymptotic Agreement in Distributed Decision Problems,
John N. Tsitsiklis, and Michael Athans. Jul 82, 31p Rept no. LIDS-P-1229
Contract N00014-77-C-0532
Revision to Rept. no. LIDS-P-1185, AD-A113 602.

We consider a distributed team decision problem in which different agents obtain from the environment different stochastic measurements, possibly at different random times, related to the same uncertain random vector. Each agent has the same objective function and prior probability distribution. We assume that each agent can compute an optimal tentative decision based upon his own observation, and that these tentative decisions are communicated and received, possibly at random times, by a subset of other agents. Conditions for asymptotic convergence of each agent's decision sequence and asymptotic agreement of all agents' decisions are derived. (Author)

N82-29314/3 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Nonlinear Zero-Sum Differential Game Analysis by Singular Perturbation Methods.
J. Sinar, and N. Farber. Jul 82, 30p NASA-TM-84271, NAS 1.15:84271

A class of nonlinear, zero-sum differential games, exhibiting time-scale separation properties, can be analyzed by singular-perturbation techniques. The merits of such an analysis, leading to an approximate game solution, as well as the 'well-posedness' of the formulation, are discussed. This approach is shown to be attractive for investigating pursuit-evasion problems; the original multidimensional differential game is decomposed to a 'simple pursuit' (free-stream) game and two independent (boundary-layer) optimal-control problems. Using multiple time-scale boundary-layer models results in a pair of uniformly valid zero-order composite feedback strategies. The dependence of suboptimal strategies on relative geometry and own-state measurements is demonstrated by a three dimensional, constant-speed example. For game analysis with realistic vehicle dynamics, the technique of forced singular perturbations and a variable modeling approach is proposed. Accuracy of the analysis is evaluated by comparison with the numerical solution of a time-optimal, variable-speed 'game of two cars' in the horizontal plane.

13.

MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A118 523/0 PC **A03**/MF **A01**
VSE Corp., Oxnard, CA.
Reliability, Maintainability, Availability; Thermal Efficiency; and Cost Effectiveness Evaluation of Naval Station Mayport Heat Recovery Incinerator (29 September 1980 - 29 September 1981).
Final rept. Oct 80-Sep 81.
Jul 82, 45p NCEL-CR-82.029
Contract N00123-82-D-0149

This report addresses the long-term evaluation of the Mayport heat recovery incinerator program. Operational data was collected from 29 Sep 80 to 28 Sep 81 and then analyzed for reliability, availability, maintainability, thermal efficiency, and operating cost. (Author)

DE82008266 PC **A03**/MF **A01**
Hittman Associates, Inc., Columbia, MD.
High-Temperature Solar-Cooling Systems.
H. M. Curran. Mar 81, 48p H-C-1007/010-81-1013
Contract AC03-79CS30202

The favorable aspects and the constraints on increasing the design point energy input temperature of solar cooling systems are identified. The study is primarily concerned with heat engines used to drive vapor compression chillers. Using existing technology, a 500 exp 0 C solar Rankine chiller could be expected to have a design point COP about 1.3 to 1.4 times as large as the design point COP of 150 exp 0 C chillers. In order to maximize the COP, water cooling is preferable to air cooling. Concentrating collectors are required to obtain acceptable efficiency at high output temperatures, and solar tracking is required. The value of heat storage in water, organic or inorganic fluids or phase change materials is discussed. Building codes and standards are considered that may limit operating temperatures and pressures, selection for working fluids, or require stationary engineers. Intermediate and large capacity mature high-temperature solar cooling systems may be expected to have somewhat lower first cost than lower temperature systems. The space heating function could best be provided in a high-temperature system by arranging the vapor compressor component as a heat pump.

DE82008279 PC **A03**/MF **A01**
Hittman Associates, Inc., Columbia, MD.
Evaluation of Hybrid Solar/Fossil Rankine Cooling Concept (Revised).
H. M. Curran. Mar 81, 28p H-C-1007/010-80-990R
Contract AC03-79CS30202

The technical evaluation indicates that the hybrid solar/fossil Rankine cooling system would have a COP about 1.5 times as large as that of an otherwise comparable organic Rankine cooling system, and would require about one-half as much solar collector area. The economic analysis indicates that even if the hybrid solar/fossil Rankine cooling system were developed to the point of being a commercial product with an economic advantage over an otherwise equivalent solar organic Rankine cooling system it would gradually lose that advantage with rising fuel costs and decreasing collector costs (in constant dollars). At best, the production and marketing period for hybrid solar/fossil systems might be on the order of two decades, which is probably inadequate to justify the development effort and the formation of a production plant and a marketing organization.

DE82008297 PC **A03**/MF **A01**
Hittman Associates, Inc., Columbia, MD.
Hybrid Refrigeration/Sorption Solar-Cooling Systems.
H. M. Curran. Aug 81, 42p H-C-1007/010-81-1044
Contract AC03-79CS30202
Portions of document are illegible.

The hybrid refrigeration/sorption concept is a technically feasible approach to solar cooling which has not yet been systematically evaluated. Various system configurations are possible, each with advantages and disadvantages relative to the others, and with respect to solar cooling systems based on the individual absorption, Rankine, and desiccant technologies. Conventional cooling and dehumidification, sorption dehumidification, and the effects on the refrigeration unit of adding a dehumidifier are discussed.

DE82008651 MF **A01**
Stephens Engineering Co., Inc., McLean, VA.
Commercialization Strategy for the Department of Energy's Solar Buildings Demonstration Program.
1981, 86p DOE/SF/11446-T3
Contract AC03-80SF11446
Portions of document are illegible.
Available in microfiche only.

Efforts reported include: conducting a survey of existing commercial demonstration projects, categorizing these projects, determining criteria for evaluating the feasibility of continuing/aborting demonstration projects, and applying the criteria and making recommendations for which projects to continue and abort. It is recommended to refurbish 114 of the projects examined and to abandon 41.

DE82013296 MF **A01**
Arkansas Energy Office, Little Rock.
Arkansas Solar Retrofit Guide.
Jun 81, 104p DOE/R6/10918-T1
Contract FG46-79R610918
Available in microfiche only.

An investigation of how solar retrofits should be designed to suit the climate and resources of Arkansas is reported. The retrofits examined were greenhouses, air heaters and water heaters. The design, construction, and performance of the retrofits are described, along with some information about sun motion and orientation and greenhouse gardening. Appended are maps, tables, and graphs of insolation in Arkansas.

DE82013323 MF **A01**
TRW, Inc., Redondo Beach, CA.
Use of Geothermal Heat for Sugar Refining in Imperial County: Geothermal Test Plan.
Feb 80, 26p DOE/ET/27039-T3
Contract AC03-79ET27039
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The resource testing and data gathering involve four sequentially scheduled stages: production well drilling tests, short term production tests, injection well drilling tests, and full scale production tests. Each stage is described and discussed.

DE82013762 PC **A10**/MF **A01**
Oak Ridge Associated Universities, Inc., TN.
Electric Home Heating: Substitution for Oil and Gas.
C. C. Burwell, W. D. Devine, Jr., and D. L. Phung.
Mar 82, 201p ORAU/IEA-82-3(M)
Contract AC05-76OR00033
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The objective of the research is to determine the potential for substituting electricity generated with surplus coal and nuclear capacity for gas and oil used for home heating. The relative effectiveness of electric heating was determined by an analysis of the purposes of extra winter sales of electricity to the residential sector compared to a similar analysis for extra winter sales of natural gas. The price of electricity for heating is determined based on utility rate structures for selected utilities (primarily located in the north and south cental portions of the country) having surplus coal and nuclear capacity throughout the decade of the 1980s. It is found that, on the average, the overall efficiency of fuel use for heating homes electrically is comparable to the use of combustion systems in the home and that electric heating is substantially less costly than direct heating with oil in regions where coal and uranium are the primary fuels used for power generation. (ERA citation 07:043995)

DE82014098 MF **A01**
Oak Ridge National Lab., TN.
Plants for Passive Cooling. A Preliminary Investigation of the Use of Plants for Passive Cooling in Temperate Humid Climates.
A. W. Spirn, A. N. Santos, D. A. Johnson, L. B. Harder, and M. W. Rios. Apr 81, 168p ORNL/Sub-81/7872/1
Contract W-7405-ENG-26
Best available copy from document source. Available in microfiche only.

The potential of vegetation for cooling small, detached residential and commercial structures in temperate, humid climates is discussed. The results of the research are documented, a critical review of the literature is given, and a brief review of energy transfer processes is presented. A checklist of design objectives for passive cooling, a demonstration of design applications, and a palette of selected plant species suitable for passive cooling are included. (ERA citation 07:042992)

DE82014656 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Energy Storage Using Phase-Change Materials for Active Solar Heating and Cooling: An Evaluation of Future Research and Development Directions.
R. J. Borkowski, T. K. Stovall, R. J. Kedl, and J. J. Tomlinson. Apr 82, 38p ORNL/TM-8098
Contract W-7405-ENG-26
Microfiche only after original copies are exhausted.

The current state of the art and commercial potential of active solar heating and cooling systems for buildings, and, in particular, the use of thermal energy storage with these systems are assessed. This assessment is used to determine the need for advanced latent heat storage subsystems in these applications and priorities for their development. Latent storage subsystems are advantageous in applications where their compactness may be exploited. These subsystems could facilitate storage in retrofit applications in which storage would be physically impossible otherwise. (ERA citation 07:043069)

DE82014973 PC **A03**/MF **A01**
Boeing Co., Seattle, WA.
Solar Project Description for Arno Kahn/Builders and Laborers Commonwealth Single Family Residence Duluth, Minnesota.
D. Moore. 30 Apr 82, 48p SOLAR/1103-82/50
Contract AB01-76CS31020

The Arno Kahn/Builders and Laborers Commonwealth Site is a house in a Minnesota suburb. It combines a modified direct-gain sun space system with a thermal envelope. The living space is separated from the sun space by a three-story mass wall. Sunlight enters the three-story solarium and heats the mass wall which in turn heats the air. The warm air is then distributed through the thermal envelope. Manually operated shades provide night insulation for the south-facing windows, and roof overhangs and a turbine vent in the solarium roof prevent overheating. Domestic hot water is preheated in four tanks located behind the window of the basement sunroom. The concrete floor in the basement provides part of the heat storage. Wood burning stoves and electric baseboard heaters provide auxiliary heating. Five modes of operation are described: collector-to-storage, collector-to-space heating, storage-to-space heating, solarium cooling and domestic hot water preheating. The instrumentation for the National Solar Data Network is described. The solar energy portion of the construction costs is estimated to be $7000.

DE82015158 MF **A01**
Burt, Hill, Kosar, Rittelmann, and Associates, Butler, PA.
International Energy Agency Instrumented Facilities Survey for Solar Assisted Low Energy Dwellings.
Feb 82, 150p DOE/NBM-2015158
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Compiled are surveys outlining the instrumentation of 38 active and passive solar projects in 9 countries (Denmark, Italy, Japan, Netherlands, Sweden, Switzerland, United Kingdom, United States, and West Germany). After the surveys themselves are presented, the data are rearranged to compare answers from similar survey questions for each of the projects. These questions address building, solar system and instrumentation descriptions and meteorological, solar system and building system instrumentatation capabilities.

DE82015225 MF **A01**
Solar Environmental Engineering Co., Inc., Fort Collins, CO.
Use of Least-Squares and Luenburger-Observer Techniques as Applied to Solar-System-Performance Data for the Crown Realty Buildings. Final Report.
D. K. Hays, and L. J. Lantz. 24 Mar 82, 32p DOE/CS/30115-T1
Contract AC03-79CS30115
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Descriptions are given of the solar heating system and instrumentation package which was installed on the Twin Crown buildings in Denver, Colorado, and of the formulation and application of least squares and Luenberger observer parameter estimation techniques. It was found that the primary use of these techniques was or identifying data problems and inadequacies. The algorithms are also easily implemented on microcomputer oriented instrumentation packages that contain floating point numerical capabilities.

DE82015488 MF **A01**
Syracuse Univ. Research Corp., NY. Energy Research Center.
Energy Education Center in Syracuse, New York: A Passive-Solar Design. Phase I. Final Report.
L. Kinney, C. Ashley, D. Ashley, G. Dike, and D. French. Jan 81, 232p DOE/CS/30357-1
Contract FC02-80CS30357
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Energy Education Center design calls for a three story building that is almost square. It will include shop-laboratory spaces; a special drafting, design, and model space; a window system and daylighting laboratory; an energy library and media center; an auditorium; and a large exhibit-display space. The design makes full use of super insulation and a ground heat reservoir. The structure is low in thermal mass, using a combination of earth-connected floor storage and a large rock bed. Natural daylighting systems of windows and reflectors are designed to offset the large lighting load. The building costs less than 4% more than a similar traditional building and has a payback period due to energy savings of less than two and one-half years.

DE82900690 MF **A01**
Swedish Council for Building Research, Stockholm.
Solar Heating Systems for Hot Water at New Buildings for Medical Service. Preliminary Studies.
1980, 59p BFR-R-140-1980
In Swedish.Portions of this report are illegible.
U.S. Sales Only. Available in microfiche only.

An investigation of the use of solar energy as complementary heat source for newly established hospitals has been presented. The arrangement of windows is an essential matter. Also the construction of flooring with a fair heat capacity and the installation of heat

collecting tiles for heat storage by phase transition is of considerable interest. The solar heating system should consist of 470 m exp 2 solar collectors on the south side and a water heat storage of 20.0 m exp 3 . The experimental building with 60 beds is calculated to have the heat requirement for hot water of approximately 290 MWh/ year. The solar heating system will supply 52%, giving a conservation of energy by 150 Mwh/year. (ERA citation 07:042941)

DE82900703 MF **A01**
Swedish Council for Building Research, Stockholm.
Heat Pump System Using Chemical Energy Storage. Preparatory Study.
A. Joensson. 1980, 103p BFR-R-145-1980
In Swedish.Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The report presents an investigation which was undertaken to appraise the technical and economical qualifications of chemical heat storage. The intention was to reduce the requirements of electric power of the conventional heat pumps which utilize outdoor air as heat source for building heating. Two types of chemical heat storage have been discussed, namely heat of phase transition and chemical heat pumps. Cost comparisons have been made for various dwellings. (ERA citation 07:043750)

DE82900779 MF **A01**
Lund Inst. of Tech. (Sweden). Div. of Heat and Power Engineering.
Network Structures and Capacities of Some Swedish District Heating Plants.
S. Stroemersten. Nov 80, 151p LUTMDN/TMVK-5100/1-151/-1980
In Swedish.Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The report deals with an empirical study of the network and capacities of some Swedish district heating systems. A quantitative assessment of flow through areas and the diameter of pipes has been made. The flow through area varies considerably and several networks have excess capacity. The report includes many diagrams. (ERA citation 07:044096)

DE82902319 MF **A01**
Bundesministerium fuer Forschung und Technologie, Bonn-Bad Godesberg (Germany, F.R.).
Study of a Long Distance Energy Supply with Special Regard to the Region Frankfurt/Main and to a Hot-Water District Heat Supply in the Region of Cologne.
H. Junk, M. Walbeck, E. Scharff, and H. Freischlad. 1981, 108p BMFT-FB-T-81-026
In German.Portions of this report are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Based on a detailed analysis of demands in the area Cologne/Frankfurt, the amount of the district heat products for this region were ascertained, which under consideration of technical conditions and entrepreneurial aspects seemed to be disposable at cost equality with competitive energy supplies. Based on these data, the technical components of the system, location and piping were fixed and first- and operating costs were determined. For a judgement of the economics, the key numbers, cash value, internal rate of interest and cost recovery rate were determined from the difference of costs between the district heat system and alternative facilities. Furthermore, specific production costs, associated prices and contribution margin were presented for each product. (ERA citation 07:044080)

N82-29966/0 PC **A05**/MF **A01**
Teknologisk Inst., Tastrup (Denmark).
Computer Program for Solar Heating System. For TI59 Programmable Pocket Computer.
F. Bason, and T. V. Hansen. 1980, 92p DE82-900840, NP-2900840
Text in Danish.

The aim of the solar program sponsored by Danish Ministry of Energy is to construct solar heating systems of high efficiency and durability, to make the solar heating prices competitive with other heating sources and to estimate the contribution of solar heating to the total heating needs. A popular evaluation of the existing and planned small-house heating systems is given with regard to insolation, seasonal variations, etc.

PB82-260456 PC **A10**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Economic Evaluation of Solar Energy Systems in Commercial Buildings: Methodology and Case Studies.
Final rept.,
Rosalie T. Ruegg, G. Thomas Sav, Jeanne W. Powell, and E. Thomas Pierce. Jul 82, 207p NBSIR-82-2540
Sponsored in part by Department of Energy, Washington, DC.

This report develops a comprehensive economic optimization model for evaluating the economic feasibility of active solar energy systems to provide service hot water and combined space heating/service hot water in commercial buildings. The model is demonstrated in a number of case studies for office buildings and retail stores. Data and assumptions for use in the model are compiled for the selected case studies. Using these data, the model is applied to estimate present value net savings (or net losses) of the solar energy systems over a 20-year life cycle. Break-even values for hot water loads, solar energy system costs, and current and future energy prices are also calculated to determine the minimum conditions under which the solar energy systems become cost effective for the selected buildings. Economic optimization paths which show the optimal solar collector areas and the corresponding present value of net savings (or net losses) associated with a range of hot water loads are developed in the case studies. Sensitivity analysis is conducted for key variables. The relationship between total live-cycle costs and the solar fraction is tested for selected cities to demonstrate how net savings (net losses) change as the solar fraction is increased.

PB82-262114 PC **A03**/MF **A01**
Swedish Council for Building Research, Stockholm.
Solar District Heating with Evacuated Collectors: First Year Experience of the Knivsta Plant,
Elisabeth Kjellson, Bengt Perers, Heimo Zinko, and Lars Astrand. 1981, 49p ISBN-91-540-3721-2, D10:1982

The experience gained during the summer enable some practical demands to be placed on solar collectors, namely: it must be possible to easily replace a solar collector without emptying the system; it must be easy to bleed the system; solar collectors must be able to withstand overheating due to boiling; and obvious leakage risks must be eliminated. There is no doubt that not all types of evacuated solar collectors fulfill these requirements and that further development is essential before large-scale installations with rational operation can be considered.

PB82-263831 PC **A05**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 30, Number 2, 1980.
1980, 78p
Text in English and Japanese, abstract in English. Also pub. in ISSN-0004-4210.

Document contains articles on the following: Mathematical Model of Glass and Furnace with Batch Melting Process (Text in English); An Automatic Measurement of Glass Thickness by Laser Beam (Text in Japanese); Electrical and Structural Properties of Pure and Tin-doped Indium Oxide Films (Text in Japanese); Empirical Expression for the Scanning Capability of TN-LCD (Text in English); Weilbull Statistics for Brittle Materials Comparison of Estimation Method (Text in Japanese); Technical Data - Bonding of Metals to Sheet Glasses by 'Cerasolzer' Technique and its Applications (Text in Japanese).

PB82-876087 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Kilns for Ceramics. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 65p
Supersedes PB80-851777.

This bibliography contains citations concerning the technology of kilns utilized in the firing of ceramic and clay greenware. Design, instrumentation, construction, safety awareness, air pollution control, and energy consumption are discussed. Heat recovery developments are included. (This updated bibliography contains 65 citations, 10 of which are new entries to the previous edition.)

13B. Civil Engineering

AD-A118 502/4 PC **A05**/MF **A01**
Army Medical Bioengineering Research and Development Lab., Fort Detrick, MD.
An Aerobic Digestion of Lime Sludge.
Technical rept. Mar 79-May 81,
Edmund A. Kobylinski, and Bruce A. Bell. Jul 82, 88p
Rept no. USAMBRDL-TR-8205

The purpose of this project was to determine the feasibility of using anaerobic digestion to treat sludges from the low-level lime addition process for phosphorus removal. Because digester supernatant is normally recycled to the influent of the sewage treatment plant, the re-release of any phosphorus is important. The operating characteristics of the digester using the lime sludge for fuel must be determined for process control and design. (Author)

AD-A118 521/4 PC **A08**/MF **A01**
Corps of Engineers, Buffalo, NY. Buffalo District.
Saint Lawrence Seaway Additional Locks Study. Main Report.
Preliminary feasibility rept.
Jul 82, 155p

This report summarizes the results of a Preliminary Feasibility Study of the navigation improvements for the St. Lawrence Seaway. The study developed traffic forecasts and commodity movement for the entire Great Lakes/St. Lawrence Seaway to determine lock capacity at the Eisenhower and Suell Locks, other St. Lawrence River Locks and the Welland Canal. Based on capacity dates structural and nonstructural navigation improvements were evaluated. Costs, benefits and impacts of different capacity improvements were derived. (Author)

AD-A118 522/2 MF **A01**
Corps of Engineers, Buffalo, NY. Buffalo District.
Saint Lawrence Seaway Additional Locks Study. Appendices.
Preliminary feasibility rept.
Jul 82, 529p
Availability: Microfiche copies only.

This report contains the supporting data for environmental, economic, geotechnical and cost estimating work. It also contains sections on public coordination and study management and a bibliography. (Author)

AD-A118 528/9 PC **A03**/MF **A01**
Corps of Engineers, Dallas, TX. Southwestern Div.
Annual Report 1981. Part I.
Final rept. 1 Oct 80-31 Sep 81.
Jan 82, 42p

This report along with its companion report (part II) present activities and accomplishments of the Southwestern Division (SWD) as related to reservoir regulation and water management activities for fiscal year 1981. Part II presents detailed summaries of reservoir conditions, water quality activities, and coordinating activities with other Federal and non-federal basin interests groups. (Author)

AD-A118 608/9 PC **A11**/MF **A01**
CH2M/Hill, Gainesville, FL.
Installation Restoration Program Records Search for Davis-Monthan Air Force Base, Arizona.
Aug 82, 239p
Grant F08637-80-G-0010

The purpose of D0D policy is to identify and fully evaluate suspected problems associated with past hazardous material disposal sites on D0D facilities, control the migration of hazardous contamination from such facilities, and control hazards to health and welfare that may have resulted from these past operations. The Davis-Monthan AFB records search included a detailed review of pertinent installation records, con-

tacts with 11 government agencies for documents relevant to the records search effort, and an onsite base visit conducted by CH2M HILL during the week of April 19 through April 23, 1982. Activities conducted during the onsite base visit included interviews with 50 past and present base employees, ground tours of base facilities, and a helicopter overflight to identify past disposal areas. The installations addressed in the records search include Davis-Monthan AFB, 18 Titan Missile Sites, and Mt. Lemmon Air Force Station (AFS).

AD-A118 615/4 PC **A09**/MF **A01**
Engineering-Science, Inc., Atlanta, GA.
Installation Restoration Program. Phase I. Records Search. Seymour Johnson Air Force Base, North Carolina.
Final rept.
Jul 82, 194p
Grant F08637-80-G-0009

The Department of Defense (DOD) has developed a program to identify and evaluate past hazardous material disposal sites on DOD property, to control the migration of hazardous contaminants, and to control hazards to health or welfare that may result from these past disposal operations. This program is called the Installation Restoration Program (IRP). The IRP has four phases consisting of: Phase I, Initial Assessment/ Records Search; Phase II, Confirmation; Phase III, Technology Base Development; and Phase IV, Operations. The following conclusions have been developed based on the results of the project team's field inspection, review of base records and files and interviews with base personnel. The areas determined to have a high potential for environmental contamination are as follows: (1) Leakage from the Fuel Hydrant System at the TAC Aircraft parking Apron; and (2) Tank Farm Fuel Spill. The areas determined to have a moderate potential for environmental contamination migration are as follows: (1) Landfill No. 4; and (2) Fire Protection Training Area No. 3.

AD-A118 635/2 PC **A07**/MF **A01**
Engineering-Science, Inc., Atlanta, GA.
Installation Restoration Program. Phase I. Records Search, Hancock Field, New York.
Jul 82, 147p

The Department of Defense (D0D) has developed a program to identify and evaluate past hazardous material sites on D0D property, to control the migration of hazardous contaminants, and to control hazards to health or welfare that may result from these past disposal operations. This program is called the Installation Restoration Program (IRP). The IRP is a four-phase program consisting of: Phase I, Initial Assessment/Records Search, Phase II, Problem Confirmation; Phase III, Technology Base Development and Phase IV, Operations. This report has the goal of the first phase of the program to identify the potential for environmental contamination from past waste disposal practices at Hancock Field and to assess the probability of contaminant migration beyond the installation boundary. The activities undertaken by Engineering-Science (ES) in Phase I included the following: (1) Reviewed site records; (2) interviewed personnel familiar with past generation and disposal; (3) Inventoried wastes; (4) Determined quantities and locations of past hazardous waste storage, treatment and disposal; (5) Evaluated disposal practices and methods; (6) Conducted field inspection; (7) Gathered pertinent information from federal, state and local agencies; (8) Assessed potential for contamination; and (9) Determined potential for hazardous contaminants to migrate.

AD-A118 670/9 CP **T02**
Corps of Engineers, Washington, DC.
National Inventory of Dams Data Base in Card Format.
Software,
Bobbie Kerns. 10 Jun 82, mag tape DOD/DF-82/009 Magnetic tape.
Source tape is in EBCDIC character set. Tape(s) can be prepared in most standard 7 or 9 track recording modes for 1/2 inch tape. Identify recording mode desired by specifying character set, track, density and parity. Call NTIS with questions. Available from NTIS $125.00. No copies furnished by DTIC.

No abstract available.

AD-A118 762/4 PC **A02**/MF **A01**
Army Engineer Waterways Experiment Station, Vicksburg, MS.
Dredged Material Research. Notes, News, Reviews, etc. Volume D-82-3. Influence of Breakwaters on Artificial Saltwater Marsh Establishment,
Hollis H. Allen, and James W. Webb. Aug 82, 8p

The U. S. Army Engineer Waterways Experiment Station (WES) conducted a study to test the feasibility of artificially establishing saltmarsh on dredged material in a high-energy wind-driven wave climate. The U.S. Army Corps of Engineers District, Mobile, sponsored the study because they planned to plant saltmarsh grass along a dike on one side of a dredged material disposal island in Mobile Bay. Technical assistance and other support were provided through DOTS. The District planned to use the marsh grass primarily for erosion control on the dike, a practice demonstrated by numerous investigators. They also hoped that the saltmarsh would serve as wildlife habitat. The District considered whether or not marsh grass transplants could be established in the high wave-energy environment without protection. The alternatives were to plant marsh grass without protection or to erect some type of wave-stilling device and plant behind it. Various types of wave-stilling devices were considered for possible use in this situation. The WES and the District considered two breakwaters, a floating tire breakwater (FTB) and a fixed breakwater. Costs and labor requirements for both breakwaters seemed too high. This led to the decision to conduct a small-scale demonstration study where marsh grasses were planted without protection on a portion of the planting site. Later, marsh grasses were planted behind an FTB and a fixed breakwater to evaluate their effectiveness in protecting plants from waves.

DE82003645 PC **A03**/MF **A01**
Curtiss-Wright Corp., Wood-Ridge, NJ. Power Systems Div.
Test and Evaluation of Hot Gas Clean-Up Devices. Phase I and II (Task 1). Technical Progress Report for the Period May 7, 1981-August 31, 1981.
1981, 44p DOE/MC/16219-T1, CW-WR-81-024
Contract AC21-81MC16219
Portions of this report are illegible.
Microfiche only after original copies are exhausted.

This report presents the status of the work performed on a program for test and evaluation of gas clean-up devices for PFBC combined cycle systems. The work was performed during the period May 7, 1981 through August 31, 1981. This is the first quarterly report since the start of the program. Work has been initiated to restore the pressurized fluidized bed (PFB) technology plant at Wood-Ridge, NJ to an operational status. Preliminary designs to incorporate each of three advanced gas clean-up devices following a first stage low pressure drop cyclone type separator have been completed. The advanced devices include a ceramic bag filter, an electrostatic precipitator and an electrostatically enhanced cyclone separator. The final design activity necessary to modify the facility has been initiated. Testing of each hot gas clean-up device concurrently with an advanced concept particle sampling system and an alkali metal content instrumentation system is planned. (ERA citation 07:043267)

DE82011312 MF **A01**
Oak Ridge Gaseous Diffusion Plant, TN.
Technical Support for the Hazardous Waste Incinerator at ORGDP.
D. H. Bunch, J. M. Kennerly, and T. O. Rogers. 1982, 34p K/ET-5036, CONF-820418-1
Contract W-7405-ENG-26
UCC-ND and GAT environmental protection seminar, Gatlinburg, TN, USA, 5 Apr 1982, Portions of document are illegible. MN only.
Best available copy from document source. Available in microfiche only.

The 83 LIP - Compliance with Toxic Substance Control Act (83-N-402) - will provide the facilities that will enable the diffusion plants to comply with government regulations (TSCA). As a part of this project, an incineration facility will be built at ORGDP to destroy PCB-contaminated wastes that are generated by the three gaseous diffusion plants, Y-12, and ORNL. This presentation will cover the following topics: (1) Overview of the project - this includes the status of the project, including the CDR, EIS, and a discussion of the proposed flow sheet; (2) Summary of technical support - the technical support being carried out to resolve the various design uncertainties associated with the project will be discussed; and (3) Results of test burns at C-E Raymond - this discussion will include the purpose of the test burns, a description of the pilot-scale equipment, the experimental conditions, and the findings of the study.

DE82011825 MF **A01**
San Bernardino Municipal Water Dept., CA.
Feasibility Study for Wastewater Treatment Utilizing Geothermal Energy in San Bernardino. Quarterly Technical Progress Report.
30 Dec 80, 72p DOE/SF/11442-T3
Contract FG03-80SF11442
Portions of document are illegible.
Available in microfiche only.

A literature search was performed to identify potential uses of low temperature geothermal heat in typical wastewater treatment plants. The uses identified were sludge digester heating, sludge disinfection, sludge drying and grease melting. Two of these uses, sludge drying and digester heating, were determined to be compatible with the San Bernardino treatment plant. Preliminary order-of-magnitude payback analyses were prepared for geothermal digester heating and sludge drying systems. The permits which may be required in order to implement a geothermal heating system project to serve the San Bernardino Wastewater Treatment Plant. The legal status of geothermal energy in the State of California is summarized. A Resource Development Plan for the proposed project outlines steps to be taken by the Water Department to ensure rapid deployment of the geothermal resource for use at the wastewater treatment plant. It also provides cost estimates for each of these steps. A plan of activities was also prepared for evaluating the geothermal resource of the entire San Bernardino area. The plan discusses three alternatives for production wells to serve the wastewater treatment plant.

DE82013438 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Spill Experience at ORNL - 1978 to 1982.
B. A. Kelley, and B. M. Eisenhower. 1982, 7p CONF-820418-17
Contract W-7405-ENG-26
UCC-ND and GAT environmental protection seminar, Gatlinburg, TN, USA, 5 Apr 1982.

The history of oil and chemical spills at Oak Ridge National Laboratory for the past four years is reported, including their causes and the remedial measures taken. The organizational structure that has evolved for handling spills is described, including the role of each ORNL division in the program. Particular initiating events which have been characteristic of more than one spill have been identified and the preventive actions taken for them described. Finally, future plans to improve the timeliness and adequacy of spill response are discussed. (ERA citation 07:044718)

DE82013441 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Preparation of Computer Data Bases for Environmental Protection.
W. F. Ohnesorge, D. P. Carnes, and R. L. Haese. 1982, 4p CONF-820418-16
Contract W-7405-ENG-26
UCC-ND and GAT environmental protection seminar, Gatlinburg, TN, USA, 5 Apr 1982.

Organizations which handle massive amounts of environmental data must use computer data bases to keep record costs as low as practicable and to make possible the efficient and timely assessment of the environment. This paper will review the basic steps necessary for planning, programming, testing and documentation of a computer program. (ERA citation 07:044717)

DE82013468 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Regional Modeling Approach to an Energy-Environment Conflict.
J. B. Mankin, J. M. Klopatek, R. V. O'Neill, and J. R. Krummel. 1981, 16p CONF-810488-5
Contract W-7405-ENG-26
International symposium on energy and ecological modelling, Louisville, KY, USA, 20 Apr 1981.

A regional analysis framework was developed to address regional environmental problems. This framework involves the use of four sets of variables: pattern, assets, and culture, as influenced by externalities. This framework was applied to the problem of resource extraction, unique ecological sites, and public opinion in the Overthrust Belt of western United States. Model

results show that action groups seeking to preserve unique sites should campaign vigorously from the start. The result will be a greater amount of land preserved even though many years will pass before preservation occurs. However, if resource developers yield early to the demand for site preservation, the result will be less land preserved and a concommitant higher total extraction of resources.

DE82014576 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Summary of Research on Coal-Liquefaction-Product Spills.
J. M. Giddings. May 82, 26p ORNL/TM-7966
Contract W-7405-ENG-26

Accidental releases of liquid products from coal conversion are among the major environmental hazards of synthetic fuel production. The objective of the research described in this report is to provide information necessary for informed decisions aimed at minimizing the impact of product spills on aquatic and terrestrial environments. A multitiered hazard assessment scheme is the framework for a research program comprising laboratory, microcosm, and field experiments and mathematical modeling. Nearly 30 natural and synthetic oils have been examined. Coal liquids are more soluble, more toxic, and more teratogenic than petroleum products. Phenolic compounds and anilines are responsible for most of the toxicity and solubility of coal liquids, suggesting that removal of oxygen and nitrogen (by hydrotreatment, for example) would reduce the environmental hazards associated with transportation and storage of these materials. The results of this research have contributed to environmental impact statements for several coal conversion facilities; other information outlets include periodic reports to the Department of Energy and publications in the open literature. (ERA citation 07:042098)

DE82016914 PC **A10**/MF **A01**
PEDCo-Environmental, Inc., Cincinnati, OH.
Acid Rain: Commentary on Controversial Issues and Observations on the Role of Fuel Burning.
M. F. Szabo, M. P. Esposito, and P. W. Spaite. Mar 82, 210p DOE/MC/19170-1168
Contract AC21-81MC19170
Microfiche only after original copies are exhausted.

Even though much information has been accumulated on the subject of acid precipitation, lack of knowledge in certain technical areas precludes an adequate understanding of (1) how serious the acid precipitation problem really is and (2) what effect controlling sources of acid precipitation precursors would have in reducing acidification. It is nevertheless possible to draw some broad conclusions regarding the problem and to ascertain the direction that the required further work should take. This report presents the results of an investigation of various issues associated with acid rain. The following topics are addressed: occurrence of acid precipitation; effects of acid precipitation; sources of acid precipitation; transport, transformation, and deposition of acid pollutants; and fuel trend analysis. Recommendations for further research are included.

DE82903486 PC **A03**/MF **A01**
Bundesministerium fuer Forschung und Technologie, Bonn-Bad Godesberg (Germany, F.R.).
Wet Air Oxidation of Waste Waters.
G. Friedhofen, H. Kerres, J. Rosenbaum, and R. Thiel. Dec 80, 43p BMFT-FB-T-80-132
In German.
U.S. Sales Only.

For purifying waste waters bench-scale research was carried out, resulting in the construction of a technical plant. The plant is designed for purifying waste waters with 12 to 15 t/day organic substances at 320 exp 0 to 330 exp 0 C and 160 to 180 bar. Conversion rate is up to 97%. Inorganic substances can be recycled; the heat of reaction is utilized for steam production. The plant operates at lower cost through biological treatment. (ERA citation 07:044719)

DE82903701 MF **A01**
Illinois Inst. of Natural Resources, Chicago.
Economic Assessment of Resources Recovery and Utilization from Coal Fines Wastes. Document No. 81/09.
J. W. Chen, A. C. Kent, and C. B. Muchmore. Feb 81, 107p NP-2903701
Portions of document are illegible.
Available in microfiche only.

The goal of this program is to develop a prototype mechanical cleaning and oil agglomeration process which can economically recover coal fines and make them into salable products in an environmentally acceptable manner. It also provides the basis for land reclamation of existing sites, and for evaluating the potential of resolution of future coal waste problems. Experimental results have indicated that the Coal Fines Recovery and Utilization process developed can successfully remove clay, shale, most of the sulfate, and some pyrites in the slurry materials. The end product is either oil agglomerates or pellets of high quality, which have a heating value between 11,500 to 12,500 Btu per pound. The waste streams of the process have been evaluated. The water can be reused after effective treatment, and the solid waste can be disposed as inert material. The environmental problems are under control. A mathematical model of the economic/environmental aspects of the process has been developed by dividing the overall process into five major processing steps: dry screening, wash, wet screen, agglomeration, and pelletization. Annualized capital, material, energy, labor and overhead costs, and total costs are predicted as a function of production rate and other operating variables, slurry characteristics and product quality requirements. Transportation and reclamation costs are also recognized. The model is used to aid in planning the experimental design for the laboratory and pilot plant scale experiments, and will be of use to predict recovery costs at a proposed resource recovery site. (ERA citation 07:042163)

PB82-254707 PC **A11**
International Brotherhood of Police Officers, Boston, MA.
Guidance Manual for Police in State and Local Noise Enforcement Procedures.
Final rept.,
1981, 228p EPA-550/9-82-429
Grant EPA-T-901113
Portions of this document are not fully legible.

This guidance manual for state and local police officers and law enforcement personnel was prepared for the Office of Noise Abatement and Control of the United States Environmental Protection Agency as part of its mandate under the Noise Control Act. The purpose of the manual is to provide law enforcement personnel with the necessary technical skills to enforce State and Local Motor Vehicle Noise Laws. The proper enforcement of motor vehicle noise violations requires the noise enforcement officer to develop specific technical skills, both in the use of noise measuring equipment as well as in the application of police practice to noise enforcement. This manual has been written for use both by the police officer. Each section of the manual corresponds to the modules of the Police Noise Enforcement Program as developed by the International Brotherhood of Police Officers. An Instructor's guide is provided for each module.

PB82-256983 PC **A10**/MF **A01**
Temple, Barker and Sloane, Inc., Lexington, MA.
Streamlining the Environmental Permitting Process: A Survey of State Reforms.
Final rept.
Jun 82, 209p
Contract EPA-68-01-5845

This report describes initiatives that each state has taken to streamline and expedite the environmental permitting process. Information for this survey was gathered primarily through telephone interviews with state officials and from secondary sources of information. The resulting report is a state-by-state description of the environmental permitting reforms that those officials interviewed consider to be the most significant. It is designed to serve as a reference tool for persons interested in learning about the types of environmental permitting reforms initiated across the country.

PB82-258401 PC **A09**/MF **A01**
Huff and Huff, Inc., La Grange, IL.
Economic Analysis of Health Risks and the Environmental Assessment of Revised Fecal Coliform Effluent and Water Quality Standards.
Final rept.,
Linda L. Huff. Mar 81, 197p IIEQ-81/15

The results of the economic analysis indicate there is an economic and environmental basis for modifying the existing fecal coliform effluent and environmental basis for modifying the existing fecal coliform effluent and water quality standards. There may be a small but measurable health risks to the water users downstream if the IEPA proposal is adopted; however, the damage to Illinois streams is a far greater impact. Complete elimination of chlorination may also be considered based upon the health risks of chlorinated organics versus viral and bacterial exposures.

PB82-258419 PC **A03**/MF **A01**
Illinois State Water Survey Div., Champaign.
Evaluation of Existing Data on Discharges from Active Coal Mines in Illinois.
Final rept.,
M. L. Terstriep, and Ming T. Lee. Oct 79, 46p IIEQ-79/35

In this study, preliminary judgments were made of the adequacy of the existing data base and on-going data collection programs to evaluate the impact of coal mine discharges on the quality of receiving streams. Emphasis was placed on the surface water programs although monitoring of groundwater in the vicinity of active mines does exist.

PB82-258732 PC **A13**/MF **A01**
Southern Illinois Univ. at Carbondale. Dept. of Forestry.
Assessment of Non-Traditional Controls on Ambient Air Quality.
Final rept.,
G. M. Aubertin, and M. P. Aubertin. Jan 81, 296p IIEQ-81/07

Roadside vegetation is widely believed to play a significant role in controlling small-particle pollution caused by vehicle traffic. This report surveys the scientific findings in this area and notes that, while there is evidence to suggest vegetation does trap pollutants, there are many important questions yet to be answered through research, such as quantifying the effect of vegetation on small particulates.

PB82-258898 PC **A06**/MF **A01**
Texas Transportation Inst., College Station.
Priority Treatment for High-Occupancy Vehicles on Interstate 10, El Paso - A Feasibility Study.
Research rept. Sep 73-Apr 82,
William R. Stockton, and Timothy J. Lomax. Apr 82, 102p TTI-2-10-74-205-14, FHWA/TX-81-52-205-14

This report presents an evaluation of the need for priority treatments for high-occupancy vehicles on Interstate 10 in El Paso, Texas. The study addresses a 24.9-mile section of roadway from Americas Avenue (FM 375) on the east to Mesa Street (US 80, SH 20) on the west. Applicable priority treatments and the anticipated effectiveness of those treatments to the year 2000 were identified.

PB82-259466 PC **A02**/MF **A01**
Norwegian Pulp and Paper Research Inst., Oslo.
Avloepsvann fra Blekerier (Waste Water from Bleaching Works).
V. Loras. 1976, 23p
Text in Norwegian.

This report is a survey of the literature regarding the bleaching of chemical substances and the compounds which are released from bleaching works. In conventional bleaching with chlorine, a number of chlorinated organic compounds are formed. It has been demonstrated that some of these compounds have a toxic effect on fish and other organisms. It has also been demonstrated that bleaching works wastes in less than fatal concentrations have a long-range effect on fish, and those effects are probably more serious than the danger of acute poisoning. Studies of the carcinogenic and mutation-causing properties of these materials have been started, but so far no results have been published. New bleaching methods and closing the backwater systems of bleaching works are being worked on in many places. A full-scale plant for dehydrating bleaching works discharges, burning organic compounds and recovering sodium chloride was to be started in Canada in 1976. If these new methods live up to expectations, it will be possible to solve the problems caused by the releasing of chlorinated compounds.

PB82-259581 PC **A19**/MF **A01**
Berger (Louis) International, Inc., East Orange, NJ.
Study of Transport Investment and Impact on Distribution of Income in Remote Areas. Phase I.
Final rept.
Feb 79, 443p AID-PN-AAJ-657

Contract AID/otr-C-1788
Prepared in cooperation with Southeast Asian Agency for Regional Transport and Communications Development, Kuala Lumpur (Malaysia).

This report describes Phase 1 of the AID-funded Southeast Asian Agency for Regional Transport and Communications Development (SEATAC) RR-2 Project to develop and test a theoretical model of the distributive impacts of transport investment. Four types of transport investment were studied. Data was collected and 1,200 households and other individuals were interviewed from Indonesia, Malaysia, the Philippines, and Thailand. The model was adjusted to reflect the project's limited resources; some indicators were changed, and components such as environmental and short-term employment-generation analyses were dropped.

PB82-260084 PC **A05**/MF **A01**
National Park Service, Washington, DC. Div. of History.
History and Prehistory in the National Park System and the National Historic Landmarks Program.
1982, 89p FNP-400-82-33

The National Park System has long been recognized as an important means of communicating American history to the public. The extent to which the national parklands, affiliated areas, and landmarks illustrate the American past can best be comprehended through a thematic framework. This framework classifies the nation's history and prehistory into 9 broad themes, ranging from 'The Original Inhabitants' to 'Society and Social Conscience.' The particulars of the thematic framework are defined in the first section of this document. The second section assigns all the historical parks, other parks and park resources of major historical significance, and historical affiliated areas to those themes, subthemes, and facets in which they are important. The third section, 'Areas Significantly Associated with Ethnic and Racial Minorities and Women,' is provided as a supplementary reference.

PB82-260225 PC **A04**/MF **A01**
Transportation Research Board, Washington, DC.
Transportation System Management and Parking,
Emery J. Hines, Ira Fink, Jon Twichell, Alain L. Kornhauser, and Thomas M. Ash. 1982, 59p TRB/TRR-845, ISBN-0-309-03323-3
Library of Congress catalog card no. 82-14087. Also pub. in ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC., 20418.

Contents: Estimating users and impacts of a regional alternative work schedule program; San Francisco joint institutional TSM program evaluation; Reducing work trip length through home mortgage subsidy incentives; Transportation-related impacts of compressed workweek -- the Denver experiment; Development of computerized analysis of alternative parking management policies; Opportunities for small-car parking; New directions in central business district parking policies.

PB82-260381 PC **A18**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
HUD Utilities Demonstration Series. Volume 13. Performance Analysis of the Jersey City Total Energy Site: Final Report,
C. W. Hurley, J. D. Ryan, and C. W. Phillips. Aug 82, 408p NBSIR-82-2474
See also Volume 11, PB-264 427. Sponsored in part by Department of Housing and Urban Development, Washington, DC. Office of Policy Development and Research.

The National Bureau of Standards was responsible for designing and installing the instrumentation and a data acquisition system (DAS) to determine fundamental engineering data from the plant and site buildings. The DAS was put on line in April 1975. The raw data from the DAS was processed by a minicomputer at NBS to obtain a broad spectrum of engineering results. This report describes these systems and presents the appropriate data and a performance analysis of the plant and size. The analysis of the data indicates a significant savings in fuel is possible by minor modifications in plant procedures. This report also includes the results of an analysis of the quality of utility services supplied to the consumers on the site and an analysis of a series of environmental tests made for the effects of the plant on air quality and noise. In general, these analyses reflected favorable results for the total energy plant. Economic and energy analyses are presented for the plant as operated during the period of the study and on a comparative basis with twelve alternative system designs applicable for providing the tenants on the site with equivalent utility services.

PB82-260423 PC **A05**/MF **A01**
Argonne National Lab., IL. Energy and Environmental Systems Div.
Nearshore Currents in Lake Michigan between Milwaukee and Chicago, 1977-78: Implications for Transport,
K. D. Saunders, and J. D. Ditmars. Oct 81, 77p IINR-81/31

Nearshore currents in southwestern Lake Michigan were measured almost continuously for one year in 1977 and 1978 at 13 stations between Milwaukee and Chicago. The current contour, with a spacing of about 15 km between stations. The temporal and spatial variabilities of the measured currents were analyzed, and the major components of the currents were found to be primarily shore-parallel in orientation. An interpolation scheme was adopted to estimate currents between stations and used with a simple diagnostic tracer model to simulate southward transport toward Chicago of hypothetical water parcels released from two areas: South Milwaukee, Wisconsin, and Zion, Illinois. The tracer model simulated the southward trajectories of the hypothetical parcels, released at 6-hr intervals, on the basis of the observed currents.

PB82-260449 PC **A04**/MF **A01**
Automated Management Systems, Inc., Landover, MD.
Evaluation of the Left Turn Red Arrow.
Final rept. Jul 80-Dec 81,
Errol C. Noel, Janice Gerbig, and Mesfin Lakew. Apr 82, 54p FHWA/RD-82/051
Contract DTFH61-80-C-00089

This report focuses on the question whether the use of red turn arrows in lieu of red balls can create a safety hazard because of motorists' misinterpretation of the device. Traffic violations of the red arrow and red ball indications were observed at 15 intersections. Sites were selected from Washington, D.C.; Delaware; Westchester County, New York; Minnesota; and Colorado. Intersection types included the cross, wye, and tee. Violation rates, defined as the number of cycles in which at least one violation (turning on the red) occurred during a cycle divided by the total number of cycles observed, were calculated for both the red arrow and red ball. The study concludes that in those jurisdictions using the red arrow for the first time, the violation rate is 6.5 percent for the red arrow as against 8.2 percent for the red ball. For jurisdictions which had used the red arrow previously, the violation rates are 5.7 and 6.7 percent for the red arrow and red ball, respectively. In both situations, the differences are statistically significant at the 5 percent level.

PB82-260548 PC **A04**/MF **A01**
Laboratorium voor Grondmechanica, Delft (Netherlands).
IGM Mededelingen. Part XXI No.4 October 1980: Offshore Gravity Foundations,
Charles J. Vos. Oct 80. 61p

Contents:
- The interactive relation in between platform design and foundation;
- Structural foundation components;
- Platform installation;
- Grouting;
- Platform installation and observation;
- Installation design;
- Operation design.

PB82-260670 PC **A12**/MF **A01**
Public Interest Economics Center, Washington, DC.
An Economic Assessment of the Benefits of the Final Effluent Limitations Guidelines for Iron and Steel Manufacturers. Executive Summary, and Volumes I, II, and III.
Rept. for Jun 81-May 82,
Robert L. Raucher. May 82, 256p EPA-230/04-82-005
Contract EPA-68-01-5838
Portions of this document are not fully legible.

An economic benefits assessment, and benefit-cost analysis of water quality improvements of the BPT and BAT Effluent Limitation Guidelines, promulgated May 1982, for Iron and Steel Manufacturers. This analysis represents a portion of the Regulatory Impact Analysis (RIA) required under Executive Order 12291.

PB82-260704 PC **A04**/MF **A01**
Illinois Univ. at Chicago Circle.
Cognitive Aspects of Transit Use in Areas of High and Low Travel Density.
Final rept. 15 Jun 80-15 Jun 81.
Siim Soot, Herbert Stenson, Margaret Esser, and Leonard Joyce. Feb 82, 72p UMTA-IL-11-0028-82-3
Grant DOT-UMTA-IL-11-0028
See also PB82-153959.

This report examines the impact of transit information dissemination on users of transit systems in Chicago and finds that comprehensive dissemination of reliable, precise, and timely transit information is vital to assure the public's maximum use of a transit system. It is recommended that regular channels of information be established between systems and riders and that the information aids available to the user should be improved.

PB82-260829 PC **A11**/MF **A01**
Weston (Roy F.), Inc., West Chester, PA.
Management of On-site and Small Community Wastewater Systems.
Final rept. Dec 78-Nov 81,
Peter A. Ciotoli, and Kenneth C. Wiswall. Jul 82, 241p EPA-600/8-82-009
Contract EPA-68-03-2753

The document represents a relatively simple, yet comprehensive guide to small communities and their engineers to develop an effective and, hopefully, optimal management program for alternative technologies which are appropriate to solving their wastewater pollution problems. Although it is prepared to respond to the requirements of the U.S. EPA Construction Grants Program, the text is applicable to all existing small communities wishing to optimize the performance of existing or planned on-site or small community wastewater treatment and disposal systems. By presenting optimum management program selection in a simple step-by-step fashion, this guide permits the user to design the appropriate program based on technical processes and physical, economic and administrative constraints extant in the service area.

PB82-261322 PC **A07**/MF **A01**
Laboratorium voor Grondmechanica, Delft (Netherlands).
Symposium: Future Needs for Hydraulic and Soil Mechanic Research in Coastal and Offshore Engineering,
P. C. de Man. 23 Aug 80, 128p
Prepared in cooperation with Delft Hydraulics Lab. (Netherlands).

Contents: Data concerning the large wave flume; Dutch research policy in coastal engineering; Facilities for offshore engineering: their strategic implications for user and supplier; Hydraulic research in coastal and offshore engineering; Future trends and needs in hydraulic research; Soil mechanic research in coastal and offshore engineering; Future needs and trends in soil mechanics research.

PB82-261405 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Design and Performance of a Field Exposure System for Evaluation of the Ecological Effects of SO2 on Native Grassland.
Journal article,
Eric M. Preston, and Jeffrey J. Lee. 31 Jul 81, 18p EPA-600/J-82-221
Pub. in Environmental Monitoring and Assessment 1, p213-228 1982.

The report describes the design and performance of two replicate field exposure systems for evaluating the ecological effects of chronic SO2 exposure on 0.5 ha plots of native Montana grassland. The SO2 was supplied at a constant rate to each plot through a network of 2.5-cm inside diameter aluminum pipes set parallel to and approximately 0.7 m above the ground with 0.8-mm SO2 release holes at 3-m intervals. The resulting SO2 concentrations on the plots varied with micrometeorological conditions. Fumigations were essentially continuous from April through October for 5 yr on one set of four plots and for 4 yr on another set of four plots. Frequency distributions of SO2 concentra-

tions were approximately log-normal and qualitatively similar to those from various area and point sources. The data from 5 years use of the system indicate that the fine-scale behavior of SO2 concentrations would be realistic.

PB82-261421 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Comparison of Laboratory and Field Avoidance Behavior of Fish in Heated Chlorinated Water.
Journal article,
J. D. Giattina, D. S. Cherry, John Cairns, Jr., and S. R. Larrick. 1981, 11p EPA-600/J-81-580
Pub. in Transactions of the American Fisheries Society 110, p526-535 1981.

The effects of intermittent chlorination and temperature selection on the movement of fish were studied in an integrated field and laboratory project on the New River at the Glen Lyn Power Plant in southwestern Virginia. Over a temperature range of 7-36C, the total number of fish sampled from the intermittently chlorinated thermal effluent was lower than control values (P greater than or = to 0.09) when total residual chlorine (TRC) concentrations were greater than or = to 0.15 mg/l. After seasonal variations were segregated into discrete intervals of field temperature and fish avoidance of TRC, a decline in fish abundance in the chlorinated, heated discharge was observed within 95% confidence limits. In most cases, laboratory-determined avoidance concentrations predicted accurately the TRC concentrations that would elicit the avoidance behavior of fish under natural field conditions.

PB82-261447 PC **A02**/MF **A01**
Oregon State Univ., Corvallis. Dept. of Electrical and Computer Engineering.
Stochastic Predictions of Sediment Yields from Small Coastal Watersheds in Oregon, U.S.A.
Journal article,
John VanSickle. 24 Feb 81, 17p EPA-600/J-82-224
Grant EPA-R-806225
Pub. in Jnl. of Hydrology 56, p309-323 1982.

For many streams in the Pacific northwestern U.S.A., nearly all sediment is transported during brief, distinct runoff events. The event sequence can be stochastically described by combining a Poisson process, a flow frequency analysis, and a sediment-rating curve. The model is used to predict long-term distributions of annual suspended-sediment yields from two small watersheds in the Oregon Coast range.

PB82-261462 PC **A02**/MF **A01**
Corvallis Environmental Research Lab., OR.
Use of Fish Ventilation Frequency to Estimate Chronically Safe Toxicant Concentrations.
Journal article,
Richard A. Tubb. Jan 82, 9p EPA-600/J-82-225
Pub. in Transactions of the American Fisheries Society, v111 n1 p70-77 Jan 82.Color illustrations reproduced in black and white.

A 96-hour toxicity test with fish ventilation frequency as the response variable was developed to estimate safe zinc concentrations for steelhead Salmo gairdneri. Two Oregon steelhead strains were exposed to zinc at different water temperatures and total hardnesses (7, 12, and 17C; 25 and 125 mg/liter as CaCO3). Ventilation frequencies enumerated from bioelectric potential generated by buccal and opercular openings and closings showed significant increases at the highest test concentration in five of 10 tests. This indicates that ventilation-frequency tests are at least as sensitive as long-term toxicity tests and may be used to screen chemicals for potential harmful effects on fish.

PB82-261736 PC **A09**/MF **A01**
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, MA.
Groundwater Control in Tunneling. Volume 1: Groundwater Control Systems for Urban Tunneling.
Final rept. Sep 78-Jun 81,
J. D. Guertin, and W. H. McTigue. Apr 82, 200p
2211-VOL-1, FHWA/RD-81-073
Contract DOT-FH-11-9516
See also Volume 2, PB82-261744.
Also available in set of 4 reports PC E99, PB82-261728.

This volume is a summary of current practice on groundwater control systems used during construction of both cut-and-cover and bored tunnels in urban areas. Eight (8) groundwater control methods are discussed including dewatering, recharge, cutoff walls and trenches, grouting, freezing, compressed air, slurry and earth pressure balance shields and electro-osmosis. Method selection procedures, contractual and risk considerations and cost factors are also discussed.

PB82-261744 PC **A10**/MF **A01**
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, MA.
Groundwater Control in Tunneling. Volume 2: Preventing Groundwater Intrusion Into Completed Transportation Tunnels.
Final rept. Sep 78-Jun 81,
H. R. Tiedemann, and J. Graver. Apr 82, 203p 1797-VOL-2, FHWA/RD-81/074
Contract DOT-FH-11-9516
Also pub. as Jacobs Associates, San Francisco, CA. rept. no. JA-1797. See also Volume 1, PB82-261736, and Volume 3, PB82-261751.
Also available in set of 4 reports PC E99, PB82-261728.

This is the second volume of a three-volume report. This Volume 2 describes various groundwater control methods for keeping tunnels dry during the life of the structure. The methods discussed include means employed to provide impervious structural concrete, types of waterproofing membranes, methods used to seal segmented tunnel linings, grouting of soils and rock, and sealing sunken tube tunnels. Problems resulting from inadequate methods or failure of control measures are discussed as well as maintenance programs to maintain the integrity of various groundwater control systems.

PB82-261751 PC **A10**/MF **A01**
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, MA.
Groundwater Control in Tunneling. Volume 3: Recommended Practice.
Final rept. Sep 78-Jun 81,
J. D. Guertin, and W. H. McTigue. Apr 82, 224p
2211-VOL-3, FHWA/RD-81/075
Contract DOT-FH-11-9516
See also Volume 2, PB82-261744, and PB82-261769.
Also available in set of 4 reports PC E99, PB82-261728.

This volume summarizes Volumes 1 and 2 and presents guidelines for recommended best practice in a concise format. Design and construction details not included in the more general descriptive nature of Volumes 1 and 2 are included herein. The final chapter of this volume is a discussion and recommendations for possible implementation of innovative methods and for further research.

PB82-261769 PC **A03**/MF **A01**
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, MA.
Groundwater Control in Tunneling: Executve Summary.
Final rept. Sep 78-Jun 81,
J. D. Guertin, W. H. McTigue, and H. R. Tiedemann. Apr 82, 35p 2211-S-4, FHWA/RD-81/076
Contract DOT-FH-11-9516
See also Volume 3, PB82-261751.
Also available in set of 4 reports PC E99, PB82-261728.

This executive summary briefly describes a three-volume report on Groundwater Control During Tunneling and in Completed Tunnels.

PB82-261959 PC **A04**/MF **A01**
Environmental Sciences Research Lab., Research Triangle Park, NC.
Estimating Concentrations Downwind from an Instantaneous Puff Release.
Rept. for Jun 80-Oct 81,
William B. Petersen. Aug 82, 72p EPA-600/3-82-078

This document provides an approach to estimating concentrations downwind of an instantaneous puff release. Dispersion of the puff is described by the Gaussian puff equation, using the didpersion parameters presented in Meteorology and Atomic Energy. The primary purpose of this work is to provide estimates of the instantaneous peak concentration or average concentration through the use of simple equations and nomograms. Example problems are provided to demonstrate the use of the equations and nomograms. A computerized Gaussian puff model is also presented.

PB82-261991 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
A Theoretical Model for Core-Annular Flow of a Very Viscous Oil Core and a Water Annulus Through a Horizontal Pipe,
G. Ooms, A. Segal, A. J. van der Wees, and R. V. A. Oliemans. 1981, 32p MEAH-11

A theoretical model has been developed for core-annular flow of a very viscous oil core and a water annulus through a horizontal pipe. Special attention was paid to understanding how the buoyancy force on the core, resulting from any density difference between oil and water, is counter-balanced. This problem was simplified by assuming the oil viscosity to be so high that any flow in the core may be neglected and hence any variation with time of the oil-water interface form. So in the model the core is assumed to be solid and the interface to be a solid/liquid interface.

PB82-262130 PC **A06**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Dept. of Civil Engineering.
Scouring Patterns in Front of Vertical Breakwaters and Their Influences on the Stability of the Foundations of the Breakwaters,
Xie Shi-Leng. Sep 81, 125p

There are two basic types of scouring pattern of a sand bed in front of a vertical breakwater under the action of standing waves. Two criteria which may distinguish these two types of scouring pattern were first found in the present study. Both of them express that the scouring patterns are dependent on the sand grain sizes as well as the wave conditions. The expressions of the scouring profiles, the ultimate maximum scouring depths and the developments of the scouring for two scouring patterns corresponding to relatively fine and coarse materials are all given based on the experimental data.

PB82-262189 PC **A03**/MF **A01**
Environmental Monitoring Systems Lab., Research Triangle Park, NC.
Sampling Air for Gaseous Organic Chemicals Using Solid Adsorbents Applications to Tenax,
Joseph F. Walling, Richard E. Berkley, Donald H. Swanson, and Frank J. Toth. Aug 82, 38p EPA-600/4-82-059

A simple input-output model for a two phase flow system with fixed bed was applied to Tenax adsorption of atmospheric contaminants. The model fit laboratory data acceptably and relationships with previous approaches were stated. Chromatographic retention volumes are used in this model which provides a means of scaling adsorbent bed dimensions and flow rates to preserve desired output characteristics. Suggestions are made about how to use the model for rational sampling design when quantitative information is needed. Practical limitations of field operations and fundamental knowledge and the need to evaluate every datum lead to practical suggestions for sampling. At least two samples collected simultaneously but at very different flow rates are suggested as necessary for quantitative work.

PB82-262221 PC **A07**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.
Logistical Systems to Support Ocean Incineration of Liquid Hazardous Wastes.
Final rept.,
Henry S. Marcus, and Charles T. Daniel. Aug 82, 144p MA-RD-830-82078
Contract MA81-SAC-10060

This report is written to aid government officials as well as potential investors in understanding the planning and implementation process involved with logistical systems to support incinerator ships. These specially designed vessels carry pumpable liquid hazardous wastes out to sea for incineration. This research explains the interdependencies among liquid hazardous waste stream characteristics, physical elements of logistical systems, and legislation and regulations at all

government levels. A particular concern of this study is the port facility within the transportation system.

PB82-262346 PC **A06**/MF **A01**
National Inst. for Transport and Road Research, Pretoria (South Africa).
Technical Recommendations for Highways: Structural Design of Interurban and Rural Road Pavements-Draft TRH-4.
1980, 106p ISBN-0-7988-1502-7

Procedures for the structural design of pavements for interurban and rural roads are presented and a choice of four different road categories, differentiated on the basis of importance, service level, traffic and riding quality, is provided. The procedures cover a range of pavement types and materials currently used in local practice. Factors such as road category, design strategy, traffic, pavement materials, environmental conditions and construction details, have to be considered.

PB82-262353 PC **A03**/MF **A01**
National Inst. for Transport and Road Research, Pretoria (South Africa).
The Transportation of Hazardous Materials,
J. C. Hillman. Apr 81, 48p RV/1/81
See PB82-154071.

The increasing use of dangerous chemicals and petroleum products by South African industry makes it necessary for some form of control to be introduced to regulate the transport of these materials before a major disaster occurs, such as has occurred overseas. This report examines all the aspects that could increase the likelihood of such a disaster occurring, including the preparedness of emergency services. It also recommends the improvements or changes required to minimize this possibility. It is apparent that the training and ability of vehicle drivers are key areas in this respect and they are discussed at length. The report concludes that legislation promulgated gradually to reinforce voluntary industrial practices will ultimately restrict this type of transport to the safety-conscious and competent operator.

PB82-262528 PC **A04**/MF **A01**
Najarian, Thatcher and Associates, Inc., Closter, NJ.
Lagrangian Transport in Estuaries and Sea-Level Canals.
Final rept.,
Tavit O. Najarian, Dong-Ping Wang, and Po-Shu Huang. Jun 82, 67p PPSP/PPRP-69

This report presents the results of a study conducted to develop a model for measurement of tide-induced and density-induced Lagrangian currents by measuring parameters which act on the currents in an estuary. A two-dimensional (in a vertical plane) nonlinear model has been modified to simulate mean Eulerian and Stokes velocities in tidal waters. The model is verified by comparing its results with known analytical solutions of Lagrangian currents in a homogeneous estuary. A set of model experiments is performed to investigate the influences of tidal forcing, density gradients, and topographic variations on the mean Lagrangian currents in an estuary. The verified model is then applied to the Chesapeake and Delaware Canal, which is forced by tides of differing amplitudes and a phase difference at its extremities.

PB82-262593 PC **A07**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Civil Engineering.
Probabilistic Safety Analysis of Earth Retaining Structures during Earthquakes,
D. A. Grivas, and C. Souflis. Jul 82, 150p CE-82-9, NSF/CEE-82030
Grant NSF-PFR79-05500

A procedure is presented for determining the probability of failure of earth retaining structures under static or seismic conditions. Four possible modes of failure (overturning, base sliding, bearing capacity, and overall sliding) are examined and their combined effect is evaluated with the aid of combinatorial analysis. The probability of failure is shown to be a more adequate measure of safety than the customary factor of safety. As earth retaining structures may fail in four distinct modes, a system analysis can provide a single estimate for the possibility of failure. A Bayesian formulation of the safety of retaining walls is found to provide an improved measure for the predicted probability of failure under seismic loading. The presented Bayesian analysis can account for the damage incurred to a retaining wall during an earthquake to provide an improved estimate for its probability of failure during future seismic events.

PB82-262635 PC **A14**/MF **A01**
Baker (Michael), Jr., Inc., Beaver, PA.
Best Current Practices for Fish and Wildlife on Surface-Mined Lands in the Northern Appalachian Coal Region.
Final rept.,
Karl E. Ohlsson, Arthur E. Robb, Jr., Clifford E. Guindon, Jr., David E. Samuel, and Robert L. Smith. May 82, 321p FWS/OBS-81/45
Contract DI-14-16-009-80-081
Prepared in cooperation with West Virginia Univ., Morgantown.

This handbook is designed to be used by surface coal mine operators, landowners, and fish and wildlife agencies as well as others as a reference document. It is not intended to burden operators with additional requirements, but rather to provide ideas applicable during mining and reclamation operations by presenting simple, cost-effective methods to improve fish and wildlife resources at the mine site and surrounding area.

PB82-262718 PC **A04**/MF **A01**
American Public Works Association, Chicago, IL.
Assessment of Sewer Sealants.
Final rept.,
Richard H. Sullivan, and William B. Thompson. May 82, 53p EPA-600/8-82-012

The control of infiltration into sanitary sewers is a major element of local governmental agencies' pollution control program. In 1978 the major product used for small diameter sewers was withdrawn from production. A study was conducted to develop performance attributes of a sewer sealant which could be used with existing sewer sealing equipment. A series of laboratory, soil box, and field evaluation studies were also devised to assist in the testing of new products.

PB82-262841 PC **A03**/MF **A01**
Council for Scientific and Industrial Research, Pretoria (South Africa). Group for Techno-Economic Studies.
Input-Output Study of By-Product Gypsum,
P. R. C. Nel. Aug 81, 29p CSIR/INFO-110

Various aspects of phosphogypsum production, accumulation, utilization, and disposal are discussed in order to identify the various options which may lead to a solution or alleviation of the problems arising from phosphogypsum accumulation or disposal, and to identify areas in which research could be done in this regard.

PB82-262882 PC **A02**/MF **A01**
Municipal Environmental Research Lab., Cincinnati, OH.
Public Acceptance of Wastewater Sludge on Land,
G. Kenneth Dotson. Aug 82, 21p EPA-600/D-82-328

The objective of this paper is to discuss the acceptance of municipal wastewater sludge on land in the United States. Application to land has been an economical disposal method for cities and a means of increasing soil productivity. Use of land for sludge disposal is increasing. Although recent research and demonstration projects have produced information needed for proper design of land application systems, the availability of the information does not always cause rural communities to accept municipal sludge. Case histories are related to show that rural-urban cooperation, technically sound planning, and educational activities help gain acceptance of landspreading.

PB82-262890 PC **A08**/MF **A01**
Florida Univ., Gainesville.
The Impact of Aquatic Plants and Their Management Techniques on the Aquatic Resources of the United States: An Overview.
Final rept.,
Jerome V. Shireman, William T. Haller, Daniel E. Canfield, and Vernon T. Vandiver. Jul 82, 157p EPA-600/4-81-007
Grant EPA-R-805497

This paper provides an assessment of nuisance aquatic plants and the problems associated with their control in the United States. Major emphasis is given to the Sun Belt states where aquatic plant control is critical due to introduction of exotic plants and extended growing seasons. The impact of aquatic plants (algae, non-native, and native plants) and their management techniques are discussed as they pertain to water quality and aquatic life. Herbicide residue data, both in the soil and water, and herbicide toxicity to aquatic organisms are presented and discussed.

PB82-262908 PC **A03**/MF **A01**
Illinois State Water Survey Div., Champaign.
An Algal Assay Technique for Aquatic Toxicants.
Rept. of investigation,
Wuncheng Wang. 1982, 36p ISWS/RI-101/82

A technique was developed for algal toxicity assays. Algal communities obtained from several sewage treatment plants and surface waters were the test specimens. The toxicant used was zinc acetate. The techniques that were developed are relatively simple, rapid, and precise. Algal responses to toxicants were measured by changes in oxygen production, and two types of responses were observed. The variations in response are caused primarily by the degree of prior acclimation of the algae to the toxicant.

PB82-263039 PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Proceedings of Workshop on the Modernization of Urban Rail Facilities, November 12-13, 1981.
Final rept.
May 82, 29p UMTA-DC-06-0279-82-1
Contract DTUM60-81-C-72062

The workshop focused on two problems associated with the modernization of urban rail facilities, namely: (1) how to maintain rail service while modernaization takes place, and (2) how to provide funds for both capital investment and maintenance. The pupose of the workshop was to provide a forum for discussion of these two issues and to produce a report that contained recommendations useful to transit and transportation authorities in carrying out modernization programs as well as to UMTA in their consideration of programs to fund. This report includes papers on planning, scheduling, and controlling urban rail modernization and construction projects; on the New York Metropolitan Transit Authority's Five-Year Capital Investment Program; and on UMTA's future support for such programs. Disccusions are included on maintenance policies and problems for both roadway and equipment. This report provides recommendations on planning, scheduling, controlling, and funding modernization of urban rail facilities.

PB82-263047 PC **A11**/MF **A01**
Iowa Inst. of Hydraulic Research, Iowa City.
Iowa Institute of Hydraulic Research (IIHR) Distributed Parameter Water Shed Model,
S. C. Jain, S. Kumar, G. Whelan, and T. E. Croley, II. Jun 82, 242p IIHR-244, ISWRRI-102
Contracts USDA-12-17-06-8-2034-X, DI-14-34-0001-9072

IIHR Watershed Model predicts water and sediment discharges from a catchment. The model describes the catchment in fine detail by retaining individual characteristics throughout the watershed and includes overland and channel models of water and sediment flows. The watershed is divided along tributary divides into subcatchments. These subcatchments are then divided along lines of steepest slope into 'streamtubes' such that no flow crosses these divides. The streamtubes are further divided into a cascade of planar elements, called 'streamtube segments', according to slope and retain individual characteristics.

PB82-263294 PC **A04**/MF **A01**
Sheladia Associates, Inc., Riverdale, MD.
Bridge Foundation Needs.
Final rept. 1980-81,
Mysore S. Nataraja. Feb 82, 58p SAI/FHWA-001, FHWA/RD-82/050
Contract DTF61-80-C-00090

Data from Bridge Inventory Statistics, Foundation Management Review and field survey conducted at State, Divisional and Regional offices are utilized to identify bridge foundation types used in different regions of the country and the performance history of different foundation ttypes. Predictions of future bridge construction and rehabilitation activities in the various States of the country are attempted, based upon the

above data. Recommendations for future research in the area of Bridge Foundations are made.

PB82-263351 PC **A12**/MF **A01**
JHK and Associates, Alexandria, VA.
Measures of Effectiveness for ISM Strategies.
Final rept. Mar 77-Sep 79,
Charles M. Abrams, John F. DiRenzo, Steven A. Smith, and Robert A. Ferilis. Dec 81, 269p FHWA/RD-81/177
Contract DOT-FH-11-9246
See also PB80-198682. Prepared in cooperation with Peat, Marwick, Mitchell and Co., Washington, DC.

This three-phase study has developed measures of effectiveness (MOE'S) for Transportation Systems Management (TSM) strategies. In Phase I, hierachical schemes of TSM strategies and tactics and comprehensive goals and objectives were developed. MOE'S were then identified which could measure the degree of attainment of each related objective through the implementation of a given tactic. Data sources, field measurement procedures and modelling techniQues were then identified for measuring or estimating each MOE. In Phase II four case studies were conducted to test and illustrate the methodology and to demonstrate the effectiveness of a variety of TSM strategies. In Phase III sampling and data collection procedures for some of the most commonly used MOE'S were developed. Also, manual and computer modelling procedures for modal split and network analysis were studied and recommendations on their applicability to TSM analyses were developed.

PB82-263518 PC **A11**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Best Current Practices for Fish and Wildlife on Surface-Mined Lands in the Eastern Interior Coal Region.
Final rept.,
E. E. Herricks, A. J. Krzysik, R. E. Szafoni, and D. J. Tazik. May 82, 228p FWS/OBS-80/68
Contract DI-14-16-0009-79-068

Developed as an aid to surface coal mine operators to identify and implement the best current practices (BCPs) for protecting and improving fish and wildlife resources on their minesite during both the active coal extraction and postmining phases of their operation. The area of concern is the Eastern Interior Coal Region (EICR), commonly referred to as the Illinois Coal Basin, comprised by the states of Illinois, Western Indiana and Western Kentucky as part of the larger Interior Coal Province. The handbook is intended to be a user-oriented document. Technical references listed at the end of each practice provide background and theory from which the techniques were developed.

PB82-263591 PC **A99**/MF **A01**
Minerals Management Service, New Orleans, LA. Gulf of Mexico OCS Regional Office.
Draft Regional Environmental Impact Statement for Proposed Gulf of Mexico OCS Oil and Gas Sales 72, 74, and 79.
Aug 82, 795p BLM-YM-ES-82-009-1792

This Environmental Impact Statement is a description of the environmental aspects and impacts of oil and gas activities resulting from these sales for the states bordering the Gulf of Mexico. It provides a description of the area, affected environment, and environmental consequences; it discusses the proposed action, issues and areas of concern, and the major alternatives of holding these sales.

PB82-263617 PC **A02**/MF **A01**
Hoofdgroep Maatschappelijke Technologie TNO, Apeldoorn (Netherlands).
A Wind Tunnel Study on the Exhaust-Gas Concentration on a Partly Covered Service Road,
G. Th. Visser. Sep 81, 25p

In an integrated city center projected for future construction the service-road to the shops is situated at about 4.50 m. below shop-ground level. In view of the fact that large parts of the service road will be covered the local authorities were in doubt as to whether or not the wind-induced ventilation would be sufficient to prevent too high exhaust-gas concentrations on the service road. Using an atmospheric boundary-layer windtunnel at a model concentration measurements were carried out along the service road and near the building facades above openings in the roof of the service road as a function of the wind direction. The exhaust gases of vehicles in motion and vehicles being unloaded were simulated by two line-sources (one for the northern and one for the southern traffic lanes). The results of the wind tunnel study show that almost everywhere on the service road the CO-concentration will remain below the maximum allowable level.

PB82-263658 PC **A08**/MF **A01**
Indiana Univ. at Bloomington. Inst. for Research in Public Safety.
1980-81 Workshop Series on Alcohol and Occupant Restraints (Western Series).
Final rept. 12 Sep 80-30 Jun 81,
James A. Palmer, and J. Philip Cornwell. Apr 82, 173p DOT-HS-806 204
Contract DTNH22-80-C-15158

A series of sixteen workshops (eight on alcohol and traffic safety, eight on occupant restraints) was conducted for state and local participants in fourteen states (and island territories) in the western portion of the United States. These workshops were provided to stimulate interest, provide guidance and outline available resources related to the need to reduce drinking-driving-related crashes and to increase the usage of existing restraint devices by automobile occupants.

PB82-263666 PC **A09**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Water Program Operations.
Municipal Wastewater Treatment: Construction Grants - 1982.
Final interim rept.
1982, 194p EPA-430/9-81-020

This book contains guidance to participants in The Environmental Protection Agencies construction grants program. It provides information and suggested procedures to help communities successfully plan and design municipal sewage treatment works, and to construct them with Federal financial support. Because this book in fact guidance, the recommendations it presents are discretionary with each program participant. A major purpose of this volume is to help communities seeking or managing a construction grant to comply with all program requirements contained in Federal regulation.

PB82-263781 PC **A08**/MF **A01**
Environmental Protection Agency, Atlanta, GA. Region IV.
Fifth Annual Environmental Impact Statement Conference Held at Atlanta, Georgia on October 22-23, 1981.
Jul 82, 152p EPA-904/9-82-098
See also PB81-161879.

This document includes 'The Role of the New CEQ in the Reagan Administration', by Nancy Nord, General Counsel, CEQ, Washington, D.C. 'EPA and NEPA in the 1980's' by Thomas R. Sheckells, Deputy Director Office of Federal Activities, U.S. EPA, Washington, D.C. 'Nearer to the Heart's Desire: Fine Turning NEPA' by Lance Wood, Chief Counsel Environmental Programs Office, Chief of Engineers, Corp of Engineers, Washington, D.C.

PB82-263807 PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Transport and Urban Activity Systems,
G. M. Said, B. G. Hutchinson, Tony Michell, Martin J. Bernard, III, and Jiwan D. Gupta. 1982, 45p TRB/TRR-848, ISBN-0-309-03351-9
Library of Congress catalog card no. 82-14313. Also pub. as ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

Contents: Policy-oriented urban-systems model--structure and application; Urban transportation in Korea--lesson for the world or a passing phase; India's transportation energy problem; Regional land use and transportation development optimization model for Delhi Region of India; Multimodal logit travel-demand model for small and medium-sized urban areas.

PB82-263815 PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
New-Product Evaluation Procedures.
Final rept.
Jun 82, 43p TRB/NCHRP/SYN-90, ISBN-0-309-03416-7
Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 82-50868. Also pub. as ISSN-0547-5570. Report on National Cooperative Highway Research Program, Synthesis of Highway Practice.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

This synthesis will be of special interest to materials engineers, maintenance managers, and others concerned with the processes used for evaluating new products. Information is presented on improved procedures and methods of communication in new-product evaluations. Procedures used by highway agencies for the evaluation and acceptance of new products and materials vary significantly from state to state. This report of the Transportation Research Board reviews evaluation processes and methods of information exchange. Ideas are presented for improving existing procedures.

PB82-263872 PC **A03**/MF **A01**
Florida State Dept. of Transportation, Tallahassee.
Value Engineering Study of Mowing Operations.
Final rept. Mar 80-Jan 81,
M. J. Trickey. Mar 82, 34p FHWA-TS-82-209
See also PB80-131154.

The report includes recommendations in the areas of types of equipment, use of herbicides and enforcement of standards. A combination mowing and herbicide program can result in a substantial reduction in the cost of mowing activities.

PB82-263880 PC **A13**/MF **A01**
Jordan (Edward C.) Co., Inc., Portland, ME.
Fate of Priority Pollutants in Publicly Owned Treatment Works.
Final rept.
Jul 82, 276p EPA-440/1-82/302
Contract 68-01-5772
See also PB81-238024.

Influent, primary effluent, secondary effluent, primary sludge, and secondary sludge samples were collected at a conventional activated sludge publicly owned treatment works (POTW) for 30 consecutive days. The samples were analyzed for priority toxic pollutants and selected conventional and unconventional pollutants. Results of the analyses were used to: (1) compare the variability of POTW influent priority pollutant concentration for a six day and 30 day sampling episode; (2) to evaluate the performance of POTW processes with report to treatment of priority pollutants; and (3) to document the fate of priority pollutants in an POTW.

PB82-264011 Not available NTIS
National Bureau of Standards, Washington, DC.
Water Rates and Residential Water Conservation.
Final rept.,
Barbara C. Lippiatt, and Stephen F. Weber. Jun 82, 4p
Pub. in Jnl. AWWA 74, n6 p278-281 Jun 82.

Descriptions of the five major types of water rate schedules are presented. A national sample of rate schedules is analyzed to measure the effect of existing water pricing policies on the dollar value to homeowners of a unit of conserved water. This value is found to be significantly lower than the average price of water, which analysts often incorrectly use to evaluate water conservation investments.

PB82-264375 Not available NTIS
National Bureau of Standards, Washington, DC.
Aerosol Characterization of a Smoldering Source.
Final rept.,
G. Mulholland, and T. J. Ohlemiller. 1982, 13p
Pub. in Aerosol Science Technology 1, p59-71 1982.

The aerosol emitted by a moderately large smoldering combustion source (16 cm in diameter) has been characterized in detail. The fuel is a permeable bed of cellulosic insulation (wood fibers) receiving its primary air supply by flow up from the bottom of the bed while the smolder wave propagates downward. The decreasing aerosol emissions with wave depth or air flow rate are

plausibly explained by filtration effects in the smolder bed.

PB82-264961 PC **A02**/MF **A01**
Environmental Monitoring and Support Lab., Research Triangle Park, NC. Quality Assurance Branch.
Statistical Basis for Laboratory Performance Evaluation Limits.
Proceedings rept.,
Paul W. Britton. Aug 82, 9p EPA-600/D-82-300

The U.S. Environmental Protection Agency (EPA) conducts studies to evaluate the performance of drinking water and wastewater laboratories that analyze samples for major EPA programs. The studies involve sample concentrates which the participating laboratories dilute to volume with reagent water. Analytical results are evaluated by comparison with confidence limits. From completed studies the characteristics of data representing proper laboratory operation are estimated using robust procedures on the data from EPA and state laboratories. From such historical statistics and their related true sample concentrations, weighted linear regressions are developed and used to predict the statistics for subsequent studies. If these regression predictions are similar to the statistics actually calculated from the current study data, the evaluation limits are calculated from the regression statistics for the sake of independence and to force a smooth relationship between the limits at different sample concentration.

PB82-264987 PC **A05**/MF **A01**
Iowa Inst. of Hydraulic Research, Iowa City.
Analysis of Sacramento River Bend Flows, and Development of a New Method for Bank Protection,
A. Jacob Odgaard, and John F. Kennedy. May 82, 99p IIHR-241
Contracts DACW05-80-C-0083, DACW39-80-C-0129

The study includes an investigation of analytical models for the description of flow and bed characteristics in a bend of the Sacramento River, California; and a study of a proposed new technique for bank protection. Existing models for the prediction of the steady-state transverse bed profile in channel bends are reviewed; and alternative models are developed and validated. The new models predict the transverse bed slope to vary linearly with d/r (the ratio of depth, d, to radius of curvature, (r) and almost linearly with the sediment-particle Froude number. It is shown, theoretically and by a physical model, that short, vertical, submerged vanes installed at incidence to the channel axis in the outer half of a river-bend channel significantly reduce the secondary currents.

PB82-265018 PC **A05**/MF **A01**
California State Dept. of Motor Vehicles, Sacramento.
Odometer Tampering Violations Analysis: Manual for Administration of State Odometer Enforcement Programs.
Final rept. Jul 80-Jun 81,
J. L. Snell. Aug 81, 84p DOT-HS-806 094
Contract DTNH22-80-C-01040

The objectives of this report are to describe the occurrence of odometer tampering within the general population of vehicles registered in California and to document the steps of odometer investigation/litigation procedures. A review of all consumer complaints alleging odometer tampering was conducted. A stratified random sample (5,000) of the general vehicle population, as well as selection of lease vehicles (2,000), were used to describe the occurrence of tampering/reporting violations. The results of this analysis indicate that odometer tampering exists within the used vehicle market. Additional studies have indicated that the frequency of occurrence is greater than observed in this analysis. A concise manual was prepared for the enforcement of odometer tampering violations and recommendations were made for improvement of the California enforcement system.

PB82-265158 PC **A05**/MF **A01**
Urban Mass Transportation Administration, Washington, DC.
Microcomputers in Transportation: Information Source Book.
Aug 82, 89p UMTA-URT-41-82-1
Prepared in cooperation with Federal Highway Administration, Washington, DC.

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation have kept up with developments in the new and rapidly changing area of transportation application of microcomputers. These two agencies have maintained up-to-date microcomputer references for transit operators, transportation planners, and traffic engineers. This document is an assorted collection of information sources for microcomputers in transportation. It contains information pertaining to: (1) microcomputer information and training; (2) microcomputer software for transportation; (3) UMTA/FHWA microcomputer projects in progress; (4) microcomputer projects in progress by various sponsors; and (5) microcomputer equipment and software.

PB82-265166 PC **A18**/MF **A01**
Engineering Foundation, New York.
Goods Transportation in Urban Areas: Proceedings of the Engineering Foundation Conference, Easton, Maryland on June 14-19, 1981.
Final rept.,
Gordon P. Fisher, and Arnim H. Meyburg. Jan 82, 419p UMTA-NY-06-0087-82-2
Contract DTUM60-81-C-71096
See also PB-286 105.

Five topics were discussed, namely: (1) Integration of UGM into the urban transportation planning process; (2) Freight movement in relation to urban and land use, planning, terminal facilities, and environment; (3) Fuel conservation and contingency planning; (4) The role of regulation in UGM; and (5) UGM research issues.

PB82-265265 PC **A10**/MF **A01**
National Bureau of Standards, Washington, DC.
The Characterization of the Chesapeake Bay: A Systematic Analysis of Toxic Trace Elements.
Technical rept.,
Howard M. Kingston, Robert R. Greenberg, Ellyn S. Beary, Billy R. Hardas, and John R. Moody. Sep 82, 210p EPA-600/3-82-085
Grant EPA-79-D-X-0717

This report describes the National Bureau of Standards (NBS) efforts in a multidisciplinary study of the Chesapeake Bay coordinated by the Chesapeake Bay Program Office of the U.S. Environmental Protection Agency. The NBS used the best available technology to determine the trace and toxic element concentrations in the water column. As part of this program, the NBS has collected and analyzed both the dissolved and suspended particulate fractions of 102 water samples covering the entire length of the Chesapeake Bay. The elements of interest include Cd, Ce, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sc, Sn, Th, U, and Zn. These analyses were accomplished using specific chemical preconcentration, separations and manipulations to prepare the samples for analysis by Neutron Activation Analysis and Graphite Furnace Atomic Absorption Spectrometry.

PB82-265307 PC **A04**/MF **A01**
Martin Marietta Labs., Baltimore, MD.
Long-Term Penthic Monitoring Programs Near the Morgantown and Calvert Cliffs Power Plants - Annual Report for the First Year's Studies. Volume I: Text.
Rept. for Jul 80-Jun 81,
A. F. Holland, M. H. Hiegel, Keith Fisher, Howard Hoffman, and George F. Johnson. Apr 82, 73p PPSP-CC-82-2-VOL-1
See also Volume 2, PB82-265315.
Also available in set of 3 reports PC E99, PB82-265299.

This report summarizes the findings of the long-term benthic monitoring program established near the Calvert Cliffs Nuclear Power Plant and the Morgantown Steam Electric Generating Station. The report presents, (1) A discussion of site and plant characteristics; (2) A description of sampling and analysis methods used; (3) A summary of the data collected between July 1980 and June 1981; (4) An evaluation of the adequacy of the sampling program and experimental design; and (5) An interpretation of analysis results.

PB82-265315 PC **A13**/MF **A01**
Martin Marietta Labs., Baltimore, MD.
Long-Term Benthic Monitoring Programs Near the Morgantown and Calvert Cliffs Power Plants - Annual Report for the First Year's Studies. Volume II: Tables and Figures.
Rept. for Jul 80-Jun 81,
A. F. Holland, M. H. Hiegel, Keith Fisher, Howard Hoffman, and George F. Johnson. Apr 82, 279p PPSP-CC-82-2-VOL-2
See also Volume 1, PB82-265307.
Also available in set of 3 reports PC E99, PB82-265299.

This volume contains tables and figures associated with the benthic community data, biomass data, and water quality data collected between July 1980 and June 1981, near Calvert Cliffs and Morgantown power plants in Maryland.

PB82-265323 PC **A14**/MF **A01**
Martin Marietta Labs., Baltimore, MD.
Long-Term Benthic Monitoring Programs Near the Morgantown and Calvert Cliffs Power Plants - Annual Report for the First Year's Studies. Volume III: Appendices A-E.
Rept. for Jul 80-Jun 81,
A. F. Holland, M. H. Hiegel, Keith Fisher, Howard Hoffman, and George F. Johnson. Apr 82, 319p PPSP-CC-82-2-VOL-3
See also Volume 2, PB82-265315.
Also available in set of 3 reports PC E99, PB82-265299.

This volume contains the following appendices: Summary of physical/chemical and sediment data collected between July 1980 and June 1981; Summaries of benthic community data for Calvert Cliffs and Morgantown long-term benthic studies; Summary of biomass data collected between July and December 1980; Summary of size-class distribution data collected for numerically dominant bivalves; and Summary of results of stepwise regression analysis.

PB82-265356 PC **A04**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.
Installation of Flexible Membrane Lining in Mt. Elbert Forebay Reservoir,
W. R. Morrison, E. W. Gray, Jr., D. B. Paul, and R. K. Frobel. Sep 81, 55p REC-ERC-82-2

During the summer of 1980, the USBR (Bureau of Reclamation) installed 117 ha (290 acres) of 1.14-mm (45-mil) CPER (reinforced chlorinated polyethylene) flexible membrane lining in the Mt. Elbert Forebay Reservoir, near Leadville, Colo. The forebay reservoir and adjacent Mt. Elbert Pumped-Storage Powerplant are part of the East Slope Power System of the Fryingpan-Arkansas Project. The installation at Mt. Elbert constitutes the world's largest single-cell flexible membrane lining application to date, and is the first time that such a material has been used in a pumped-storage reservoir for seepage control. To meet the USBR requirement for power online for the powerplant by July 15, 1981, the installation had to be accomplished in one construction season. This would allow sufficient time to fill the reservoir and conduct acceptance tests on the generating units and accessory equipment. Summarized in this report are the construction work associated with the installation of the membrane lining, the quality assurance program conducted during the installation, and the research program being implemented to monitor the performance of the lining.

PB82-265406 PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Pavement Management,
Frederic R. Ross, Billy Connor, Robert L. Lytton, Michael I. Darter, and Mohamed Y. Shahin. 1982, 85p TRB/TRR-846, ISBN-0-309-03324-1
Library of Congress catalog card no. 82-14321. Also pub. in ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

The 11 papers in this report deal with the following areas: effect of pavement roughness on vehicle fuel consumption; rational seasonal load restrictions and overload permits; state-level pavement monitoring program; data requirements for long-term monitoring of pavements as a basis for development of multiple regression relations; simplified pavement management at the network level; combined priority programming of maintenance and rehabilitation for pavement networks; Arizona pavement management system: Phase 2-verification of performance prediction models and development of data base; overview of paver pavement management system; economic analysis of field implementation of paver pavement management

system; development of a statewide pavement maintenance management system; and, prediction of pavement maintenance expenditure by using a statistical cost function.

PB82-265471 PC **A11**/MF **A01**
Maryland Univ., Solomons. Chesapeake Biological Lab.
Historical Review of Water Quality and Climatic Data from Chesapeake Bay with Emphasis on Effects of Enrichment,
Donald R. Heinle, Christopher F. D'Elia, Jay L. Taft, John S. Wilson, and Marthe Cole-Jones. Sep 82, 243p UMCEES-80/15-CBL, EPA-600/3-82-083, EPA/CBP-TR-002E
Grant EPA-R-806189010
Also pub. as Chesapeake Research Consortium, Inc., Baltimore, MD. rept. no. CRC-PUB-84.

Review of the available data on water quality in Chesapeake Bay has revealed changes over recent decades caused by enrichment with nutrients. In the upper and middle bay, and several tributaries, concentrations of algae present during the summer months have increased since the mid 1960's. There have been decreases in the clarity of the water associated with increased algal stocks. Nutrient concentrations have also increased, phosphorus more notably so than nitrogen. In some of the tributaries increased algal production has led to reduced concentrations of oxygen below the halocline in the middle part of the estuary. Oxygen concentrations in the open bay have not changed greatly with the possible exception of extreme conditions, as during periods of extensive ice cover. Since 1969 or 1970, however, stocks of many anadromous species and marine spawners representing higher tropic levels have declined to new long-time lows.

PB82-265570 PC **A05**/MF **A01**
Futures Group, Inc., Glastonbury, CT.
Outer Continental Shelf Oil Spill Probability Assessment. Volume 1: Data Collection Report.
Final technical rept.
Richard Golob, Kathy Bjorhus, and Daniel McShea. Jul 82, 79p BLM/AA/TE-82/001
Contract DI-AA851-CTO-69
See also Volume 2, PB82-265588. Prepared in cooperation with World Information Systems, Cambridge, MA.

This report presents a portion of the results obtained under a contract for a study titled 'Oil Spill Probability Projections'. The study objectives were to collect world-wide accident and exposure data for tankers, platforms, pipelines, single-point moorings and marine terminals from the longest time period possible and to use this data to examine the relationships between the accident and the exposure data, the intent being to find exposure variables which could be used to predict future number and volume of spills. This volume discusses the study objectives, the nature of the data collected, the methods used to collect the data, the data sources, the limitations inherent in these activities, the editing process, and recommendations for future data collection procedures.

PB82-265588 PC **A09**/MF **A01**
Futures Group, Inc., Glastonbury, CT.
Outer Continental Shelf Oil Spill Probability Assessment. Volume 2: Data Analysis Report.
Final technical rept.,
Brian Murphy, William Olender, Robert Yamartino, Ralph King, and Joseph Wright. Jul 82, 183p BLM/AA/TE-82/002
Contract DI-AA851-CT0-69
See also Volume 1, PB82-255570. Prepared in cooperation with Environmental Research and Technology, Inc., Concord, MA.

This report presents a portion of the results obtained under a contract for a study titled 'Oil Spill Probability Projections'. The study objectives were to collect world-wide accident and exposure data for tankers, platforms, pipelines, single-point moorings and marine terminals from the longest time period possible and to use this data to examine the relationships between the accident and the exposure data, the intent being to find exposure variables which could be used to predict future number and volume of spills. The volume discusses the study objectives and describes the analyses performed with the compiled data base.

PB82-265612 PC **A99**/MF **E04**
Jacobs Engineering Group, Inc., Pasadena, CA.
Development Document for Effluent Limitations Guidelines, New Source Performance Standards and Pretreatment Standards for the Inorganic Chemicals Manufacturing Point Source Category.
Final rept.,
Henry Cruse, Michael Warner, Bonnie J. Parrott, Chester Kaminski, and Mahendra L. Shah. Jun 82, 953p EPA-440/1-82/007

Thirty five inorganic chemical product subcategories were screened for the purpose of establishing wastewater effluent limitations guidelines for existing sources, standards of performance for new sources, and pretreatment standards for new and existing sources in this study. Some are as follows: Chlor-Alkali, Hydrofluoric Acid, Chrome Pigments, Hydrochloric Acid, Sulfuric Acid, Carbon Dioxide, Carbon Monoxide and by-product Hydrogen, Boric Acid, and Sulfur Dioxide.

PB82-266081 PC **A05**/MF **A01**
Transportation Research Board, Washington, DC.
Automotive Technology, Information Needs of Highway Users, and Promotion of Safety Belt Usage,
James L. Duda, Bernard J. Schroer, Andrew Chase, Paul Abramson, and Howard Stein. 1982, 86p TRB/TRR-844, ISBN-0-309-03322-5
Library of Congress catalog card no. 82-14106. Also pub. as ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

Contents: Transportation R&D technology--the diagnostic motor vehicle information concept; Evaluation of magnitude of unnecessary automobile repairs; Electric vehicle technology update; Analysis of the effectiveness of bumper standard FMVSS 215; Present status of inertia-collection system; Transverse air-cushion restraints for commuter vans and small buses; Positive-guidance demonstration project at a railroad-highway grade crossing; Effectiveness of changeable message signing at freeway construction site lane closures; Reading time and accuracy of response to simulated urban freeway guide signs; Use of computerized roadway-information system in safety analyses; Four appoaches to instruction in occupant-restraint use; Contributory negligence in promotion of safety belt use; Impact of legislation and public information and education on child passenger safety; and Automobile-restraint controversy--analysis and recommendations.

PB82-266107 PC **A03**/MF **A01**
BioTechnology, Inc., Falls Church, VA.
Signing and Delineation of Special Usage Lanes. Volume 1: Executive Summary.
Final rept. Jul 77-Sep 80,
Richard F. Pain, and Beverly G. Knapp. Jan 82, 34p FHWA/RD-81/062
Contract DOT-FH-11-9291
See also Volume 2, PB82-266115.
Also available in set of 3 reports PC E99 , PB82-266099.

The energy shortages of the 1970's brought a proliferation in the number of reserved lanes and considerable variation in the signing and delineation of these lanes could be found among regions, among cities and even within metropolitan areas. Recognizing the need for more uniformity in signing and marking systems, this study determined the information requirements of users and non-users of such lanes; it developed signing and delineation systems to meet the information requirements; and evaluated the efficiency of the developed signing and delineation systems.

PB82-266115 PC **A12**/MF **A01**
BioTechnology, Inc., Falls Church, VA.
Signing and Delineation of Special Usage Lanes. Volume 2: Development of Signing and Delineation Alternatives.
Final rept. Jul 77-Sep 80,
Richard F. Pain, Beverly G. Knapp, Robert S. Hostetter, and Douglas J. Mace. Jan 82, 257p FHWA/RD-81/063
Contract DOT-FH-11-9291
See also Volume 1, PB82-266107, and Volume 3, PB82-266123.
Also available in set of 3 reports PC E99, PB82-266099.

The report analyzes reserved lanes across the country and development of initial reserved lane information systems. The systems were evaluated through 13 laboratory and closed field experiments. The laboratory findings and several reserved lane information systems were then verified through operational field studies. This volume, the second in the series, describes the reserved lane inventory, the site visits, information analysis and development of initial signing systems.

PB82-266123 PC **A10**/MF **A01**
BioTechnology, Inc., Falls Church, VA.
Signing and Delineation of Special Usage Lanes. Volume 3: Field Experiments and Implementation Suggestions.
Final rept. Jul 77-Sep 80,
Richard F. Pain, Beverly G. Knapp, and Fred R. Hanscom. Jan 82, 206p FHWA/RD-81/064
Contract DOT-FH-11-9291
See also Volume 2, PB82-266115.
Also available in set of 3 reports PC E99, PB82-266099.

This volume, the third in the series, describes the six operational evaluations that were conducted at seven east and west coast cities and includes design suggestions for information systems for nine classes of reserved lanes.

PB82-266172 PC **A10**/MF **A01**
American Public Works Association, Chicago, IL.
Design Manual: Swirl and Helical Bend Pollution Control Devices.
Richard H. Sullivan, James E. Ure, Fred Parkinson, and Paul Zielinski. Jul 82, 213p EPA-600/8-82-013
Grant EPA-R-803157

This design manual contains descriptions of design procedures and operating experience to date, including results obtained, for secondary flow pollution control devices. Two types of combined sewer overflow regulators are described: the swirl and the helical bend regulator/separator. Both unitsare static, that is, operate withoutmoving parts and require no outside source of power. Both can remove up to 50 percent of the suspended solids. Both are also effective for treating separate stormwater discharges. Both serve a dual function - treatment and regulation of the flow. The units treat waste flows by concentrating the solids in a small fraction of the total flow. This reduced volume becomes economical, or in effect, possible to treat in conventional wastewater treatment facilities. The swirl degritter is also described. The unit's high efficiency and essential lack of moving parts makes it suitable for use with stormwater, sanitary sewage and raw potable water to protect pumps, wet-wells and downstream facilities from grit. A primary treatment device and a sediment load polishing unit are also described. In addition, several devices and applications which have been developed by others as a result of the basic information on the flow field characteristics and capabilities are described.

PB82-266180 PC **A05**/MF **A01**
Bureau of Mines, Washington, DC.
Accomplishments in Waste Utilization: A Summary of the Seventh Mineral Waste Utilization Symposium.
Information circular/1982,
S. A. Bortz, and R. S. DeCesare. Jul 82, 94p BUMINES-IC-8884
Library of Congress catalog card no. 82-600089.

With IIT research institute as a cosponsor, this seventh mineral waste Utilization Symposium was funded by the Bureau of Mines through its Division of Mineral Resources Technology. Environmental scientists and engineers from five countries (Canada, Netherlands, Austria, England, Guatemala) besides the United States participated in the symposium, which was held Oct. 20-21, 1980, at the Chicago campus of IIT Research Institute. Of the 25 papers presented on the reclamation and recycling of mining and mineral wastes, municipal solid waste, industrial waste, and scrap metal, 21 are summarized herein.

PB82-266206 PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Symposium on Aspects of Subsurface Drainage

Related to Pavement Design and Performance,
Barry J. Dempsey, Gary L. Hoffman, J. B. MacMaster, G. A. Wrong, and W. A. Phang. 1982, 45p TRB/TRR-849, ISBN-0-309-03352-7
Library of Congress catalog card no. 82-14323. Also pub. as ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

The 5 papers in this report deal with the following areas: laboratory and field studies of channeling and pumping; subbase permeability and pavement performance; pavement drainage in seasonal frost area, Ontario; simulating pavement performance under various moisture conditions; and, pumping mechanisms of foundation soils under rigid pavements.

PB82-266214 PC **A04**/MF **A01**
GCA Corp., Bedford, MA. GCA Technology Div.
Carbon Monoxide Hot Spot Guidelines. Volume II: Rationale,
Frank Benesh. Aug 78, 65p GCA-TR-78-32-G(3), EPA-450/3-78-034
Contract EPA-68-02-2539
See also Volume 1, PB82-238072 and Volume 3, PB82-266222.

This report presents the rationale used in developing the analytical techniques for the carbon monoxide hot spot guidelines. Discussed in this report are the technical aspects of the guidelines, including the assumptions used in developing hot spot procedures. Since the guidelines were based largely on EPA's Indirect Source Guidelines, these are discussed in some detail, as well.

PB82-266222 PC **A08**/MF **A01**
GCA Corp., Bedford, MA. GCA Technology Div.
Carbon Monoxide Hot Spot Guidelines. Volume III: Workbook,
Theodore P. Midurski. Aug 78, 155p GCA-TR-78-32-G(3), EPA-450/3-78-035
See also Volume 1, PB82-238072.

This report presents a summary of the guidelines for the identification and evaluation of localized violations of carbon monoxide air quality standards in the vicinity of streets and highways. The guidelines are provided to facilitate the rapid and efficient review of CO conditions along existing roadway networks, without the need for extensive air quality monitoring, and are based upon the use of limited traffic data. Two stages of review are provided for. Preliminary screening, performed with simple nomographs included herein, simply identifies those locations with the potential to violate CO standards; no quantitative estimate of CO concentrations results from preliminary screening. Verification screening, using procedures and forms provided herein, allows for consideration of additional site-specific conditions and provides quantiative estimates of maximum CO concentrations. Both screening procedures are performed manually and are based upon the EPA Indirect Source Review Guidelines. Data collection procedures, computation techniques, and forms are recommended, and examples are provided. A more comprehensive explanation of the guidelines in terms of their development, technical basis, capabilities and limitations is provided in Volume I.

PB82-266248 PC **A05**/MF **A01**
Midwest Research Inst., Kansas City, MO.
Effectiveness of Clear Recovery Zones.
Final rept.,
Jerry L. Graham, and Douglas W. Hardwood. May 82, 78p TRB/NCHRP-247, ISBN-0-309-03413-2
Also pub. in ISSN-0077-5614. Library of Congress catalog card no. 82-60287. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Report on National Cooperative Highway Research Program.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

This report documents the results of a study of the safety effectiveness of clear recovery zones. Accident data were analyzed for highways constructed under each of three roadside design policies in the States of Illinois, Minnesota, and Missouri. Two-lane highways, four-lane freeways, and four-lane divided nonfreeways were considered. A statistically significant difference in single-vehicle run-off-road accident rates was found between each roadside design policy for each highway type. There was no statistically significant difference in the distribution of accident severities for the various roadside design policies. It was found that the cost-effectiveness of roadside design improvements can vary widely between highway sections due to differences in accident rates, traffic volumes, terrain, required construction quantities, unit construction costs, and right-of-way requirements. Four design examples were presented illustrating application of a cost-effective procedure for choosing a roadside design policy.

PB82-266255 PC **A02**/MF **A01**
AGA A.B. Innovation, Lidingoe (Sweden).
Ozone and Nitrogen Oxides in Gas Shielded Arc Welding,
1981, 23p GIF-1073

This paper describes briefly the results of five years' research into the formation of ozone and nitrogen oxides in connection with gas shielded arc welding. A detailed description is given of amounts of these pollutants generated and how the concentrations vary in space under controlled airflow conditions. Methods are described of reducing ozone generation.

PB82-266362 PC **A22**/MF **A01**
Transportoekonomisk Inst., Oslo (Norway).
Trafikksikkerhets-handbok (Traffic Safety Handbook).
1982, 502p
Text in Norwegian. Sponsored in part by Samferdselsdepartementet, Oslo (Norway).

The manual on safety in streets and highways is divided into 4 sections, as outlined: (1) The general information section gives traffic accident statistics, provides some analysis of accident causes and discusses the costs involved; (2) A 'types of remedial measures' section covers area planning, road planning, taxes on fuel, subsidies for public transportation and special concessions for arrangements calculated to reduce the number of accidents; (3) An exhaustive 'specific remedial measures' section is concerned with road building and road appurtenances, regulation of traffic, vehicular design and equipment, inspection of vehicles and workshops, driver examinations and training, traffic indoctrination campaigns, training for school children, traffic surveillance and sanctions for traffic offenders; and (4) Reference material includes symbols, abbreviations and a bibliography.

PB82-811225 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Diesel Exhaust Emissions. 1974-May, 1982 (Citations from the American Petroleum Institute Data Base).
Sep 82, 382p
Supersedes PB81-806416 and PB80-805419.

This bibliography cites research reports concerning exhaust emissions from diesel motor vehicles. Topics include engine design, techniques of measuring gases, pollution control, and fuel additives. (This updated bibliography contains 372 citations, 107 of which are new entries to the previous edition.)

PB82-811233 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Thermal Pollution: Biological Effects. 1974-April 1981 (Citations from the NTIS Data Base).
Sep 82, 300p

Abstracts covering the effects of heated effluents on fish, shellfish, microorganisms, and plants in both fresh and salt water are presented, including the effects on growth, ecology, metabolism, heat tolerance, and productivity. The effluent sources are both power and industrial plants. (This updated bibliography contains 291 citations, none of which are new entries to the previous edition.

PB82-811241 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Thermal Pollution: Biological Effects. 1974-August, 1982 (Citations from the NTIS Data Base).
Sep 82, 76p
Supersedes PB81-806135 and PB80-806490.

Abstracts covering the effects of heated effluents on fish, shellfish, microorganisms, and plants in both fresh and salt water are presented, including the effects on growth, ecology, metabolism, heat tolerance, and productivity. The effluent sources are both power and industrial plants. (This updated bibliography contains 67 citations, all of which are new entries to the previous edition.

PB82-811365 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Septic Tank and Household Sewage Systems Design and Use. 1964-August, 1982 (Citations from the NTIS Data Base).
Sep 82, 209p
Supersedes PB81-807273 and PB80-808496.

The bibliography of Federally-funded research presents abstracts on the design and regulations for septic tanks, as well as non-septic treatment systems. Subjects included are soil properties, water pollution, regulations, and planning for septic systems. (This updated bibliography contains 201 citations, 19 of which are new entries to the previous edition.)

PB82-811373 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Septic Tank and Household Sewage Systems Design and Use. 1970-August, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 220p
Supersedes PB81-807315 and PB80-808504.

The bibliography provides worldwide research reports on septic tanks and other sewage treatment units used for household sewage systems. Construction materials, design, service life, and a comparison of systems are described. The suitability of soils for drainage and adsorption to prevent pollution of ground water from bacteria and viruses are discussed. Purification processes and the environmental constraints of disposal systems are included. (This updated bibliography contains 210 citations, 16 of which are new entries to the previous edition.)

PB82-811399 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Coastal Zone Management and Planning. 1977-June, 1981 (Citations from the NTIS Data Base).
Sep 82, 160p

The planning and management of both natural resources and urban growth in the coastal zone are covered in this bibliography. The topics included management and planning concerning: ecology, water rights, environmental problems, land use, fisheries, recreation, economic development, and shore protection. Government administration and citizen participation studies are included. (This updated bibliography contains 251 citations, none of which are new entries to the previous edition.)

PB82-811407 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Coastal Zone Management and Planning. 1977-August, 1982 (Citations from the NTIS Data Base).
Sep 82, 39p
Supersedes PB81-807240 and PB80-808397.

The planning and management of both natural resources and urban growth in the coastal zone are covered in this bibliography. The topics included management and planning concerning: ecology, water rights, environmental problems, land use, fisheries, recreation, economic development, and shore protection. Government administration and citizen participation studies are included. (This updated bibliography contains 30 citations, all of which are new entries to the previous edition.)

PB82-875238 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Biodegradation of Toxic Pulping Effluents. 1972-September, 1982 (Citations from the Institute of Paper Chemistry Data Base).
Rept. for 1972-Sep 82.
Sep 82, 129p
Supersedes PB82-853433.

This bibliography contains citations concerning problems, resolutions, and evaluations of biotreatment of

biodegradable toxic effluents from pulp mills. Mutagenic characteristics of waste from chlorination of most pulps are discussed relative to the risks involved to water plant and animal life. Laboratory measurements determining toxicity of effluents and various industrial biodegradation processes are included. (This updated bibliography contains 86 citations, 22 of which are new entries to the previous edition.)

PB82-875790 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Environmental Impacts: Computer Analysis. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 216p
Supersedes PB81-853228.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning computerized simulation and mathematical modelling, computer programs and calculations, and computer-aided design for the determination, evaluation, and specification of environmental impact related to various human activities (commercial, recreational, and governmental) and equipment and systems associated with these activities. Emphasis is on environmental impact of underground and surface mining, coal gasification plants, and other energy related subjects. (This updated bibliography contains 176 citations, 80 of which are new entries to the previous edition.)

PB82-875816 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Air Pollution Control: Computer Analysis. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 235p
Supersedes PB81-853160.

This bibliography contains citations concerning computerized mathematical modeling and simulation, computer-aided design, and computer programs and calculations for the operation, performance analysis and evaluation, and the design of systems, equipment, and techniques for air pollution control and abatement. Emissions from coal generated power plants and their control are stressed. (This updated bibliography contains 172 citations, 38 of which are new entries to the previous edition.)

13C. Construction Equipment Materials, and Supplies

PB82-260415 PC **A04**/MF **A01**
Missouri Highway and Transportation Dept., Jefferson City. Div. of Materials and Research.
Waste Products in Missouri with Potential Highway Application.
Missouri cooperative highway research program (Final).
Apr 82, 70p MCHRP-81-2, FHWA/RD-82-P0007

A statewide survey to locate solid waste products having potential for highway applications was conducted during 1981. The survey inventory includes 305 separate entries representing some 80 million tons of waste material currently accumulating at an annual rate of about 5 million tons. Due to the State being a prime source of metal ore mining and smeltering, vast tonnages of mine tailings have accumulated. Also, considerable tonnages of electric utility waste products continue to accumulate in the form of fly ash, dry bottom boiler ash, and wet bottom boiler slag. Possible uses for each waste material product are cited. From the summarized inventory, certain waste products were selected that appear to warrant further evaluation.

PB82-261165 PC **A04**/MF **A01**
Asahi Glass Co. Ltd., Yokohama (Japan). Research Lab.
Reports of the Research Laboratory, Asahi Glass Co., Ltd.: Volume 27, Number 1, 1977.
1977, 75p
Text in English and Japanese, abstract in English.

Document contains articles on the following subjects: Alkali Dissolution from Ampoule Glasses (Text in Japanese); Hard Coating on PMMA with Organic-Inorganic Composite Film (Text in Japanese); Catalytic Combustion of Small Amounts of Styrene Over Precious Metal Catalyst (Text in Japanese); Thin ETFE Coating by Electrostatic Powder Coating Technique (Text in English); F NMR Analysis of Decomposition Products of Sulfur Hexafluoride Exposed to High Current Arc (Text in English); An Application of the Knapsack Algorithm to a Vehicle Scheduling Problem (Text in Japanese); and Mechanical Properties of Glass Fiber Reinforced Cement Composites (Text in Japanese).

PB82-261918 PC **A05**/MF **A01**
Laboratorium voor Grondmechanica, Delft (Netherlands).
IGM Mededelingen. deel XXII No. 2 - December 1981: Groutankers in de Praktijk (Grout Anchors in Practice).
C. Spelt. Dec 81, 83p
Text in Dutch.

The object of this publication is to provide the user of grout anchors with information on the special mechanical properties of these anchors and to give guidance as to the practical possibilities, with particular attention to the testing of grout anchors within the context of design and of quality control. Accordingly, recommendations for tests as a basis for the design of the anchors and their quality control have been included, which can, together with the verification test requirements, be included in the specification in tender documents. This publication gives some examples of actual applications. The execution of the anchors is also described, with due attention to the workmanship, as this considerably affects the quality of the anchors installed. Attention is drawn to anumber of aspects that more particularly have to be watched during the execution of the work. The latter also includes the inspection test for checking the soundness of the anchors.

PB82-261975 PC **A02**/MF **A01**
Structural Engineering Research Centre, Madras (India).
Experimental Techniques for Assessment of Corrosion of Embedded Steel in Concrete in Marine Environment.
Research paper,
K. Mani, and Zacharia George. 1981, 12p

The general requirements for assessment for structures to be resistant to corrosion call for several experimental techniques for the detection of corrosion in steel embedded with or attached to the structures. The corrosion of embedded steel comes to be noticed only after the surrounding concrete has cracked; the corrosion process would have started much earlier. Visual surveillance has been the widely adopted methods for checking the structures for corrosion and no standard procedures and techniques are adopted for regular inspection of structures. As the theory of corrosion process and the influencing factors have been fairly understood, it should now be possible to develop and employ standard procedures and suitable technique for monitoring structures for detection of corrosion. This paper attempts to describe and discuss possible techniques which can be effectively used for monitoring the structures and the developments needed to obtain reliable results.

PB82-262171 PC **A07**/MF **A01**
Transportation Research Board, Washington, DC.
Asphalts, Asphalt Mixtures, and Additives.
Scott Shuler, R. A. Jimenez, Jack E. Stephens, R. T. Woodhams, and Amir F. Bissada. 1982, 136p TRB/TRR-843, ISBN-0-309-03320-9
Library of Congress catalog card no. 82-12579. Also pub. in ISSN-0361-1981.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

The 18 papers in this report deal with the following areas: specification requirements for asphalt-rubber; laboratory measurements of asphalt-rubber concrete mixtures; field evaluation of rubber-modified bituminous concrete; methods of increasing fracture toughness of asphalt concrete; evaluation of filler effect of sulfur in asphalt binder; predicting surface friction from laboratory tests; design and performance of bituminous friction-course mixes; performance observations on open-graded bituminous concrete overlays in Connecticut; effects of baghouse fines and mineral fillers on properties of asphalt mixes; effect of mix variations on asphalt pavement life: North Oakland-Sutherlin Project; dune sand-aggregate mixes and dune sand-sulfur mixes for asphalt concrete pavements; asphalt concrete mixtures made with cement-coated aggregates; factors affecting unconfined compressive strength of lime-bituminous-emulsion-treated clay; laboratory test method for predicting moisture-induced damage to asphalt concrete; chemistry of asphalt-aggregate interaction; relationship with pavement moisture-damage prediction test; silane pretreatment of mineral aggregate to prevent stripping in flexible pavements; evaluating asphaltene settling test and relating results to physical properties of paving asphalts; asphalt temperatures susceptibility and its effect on pavements.

PB82-262437 PC **A04**/MF **A01**
Ohio State Univ., Columbus.
Development and Evaluation of a Mechanized Pavement Patching Machine.
Final rept.
D. A. Guenthev, and Denis E. Donnelly. Jun 82, 54p FHWA/TS-82-211
Contracts DOT-FH-11-9307, DOT-FH-11-8188
Prepared in cooperation with Colorado State Dept. of Highways, Denver.

This report looks at the state of the art in mechanized pothole patching. Initial evaluations were based on literature reviews and interviews with the personnel of various State highway departments. The objective of a single machine incorporating the various operations required for a fully mechanized pothole patcher appeared to be fully met by the Gabriel Perma-Patch machine. The equipment was then evaluated for performance and patch durability by the Colorado Dept. of Highways. Performance of the equipment was very good although being a prototype device, the perma-patch machine experienced several mechanical breakdowns. Patch durability was very good. No failures were observed in the patches placed during this study.

PB82-263070 PC **A04**/MF **A01**
Idaho Univ., Moscow. Dept. of Civil Engineering.
Predicting Moisture-Induced Damage to Asphaltic Concrete - Field Evaluation.
Final rept.,
R. P. Lottman. May 82, 61p TRB/NCHRP-246, ISBN-0-309-03412-4
See also PB82-133000. Also pub. in ISSN-0077-5614. Library of Congress catalog card no. 82-60219. Sponsored in part by American Association of State Highway and Transportation Officials, Washington, DC., and Federal Highway Administration, Washington, DC. Report on National Cooperative Highway Research Program.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418.

A laboratory test method for the prediction of moisture damage in dense graded asphaltic concrete mixtures was developed in the Phase I study of NCHRP Project 4-8(3) and is described in NCHRP Report 192. The method consists of obtaining ratios of tensile splitting strength and resilient modulus using compacted laboratory specimens subjected to vacuum saturation and to freeze-plus-warm-water-soak accelerated moisture conditioning. The ratios are used to predict short-term and long-term moisture-induced damage representative of field conditions. Results from the Phase II, 5-year field evaluation portion of the study, are presented in this report. The purpose of the study was to examine the predictive capabilities of the test method and to determine if the predictive ratios and observed stripping were reasonably representative of pavement conditions in the field. The test method appears to give reasonable predictive levels in the field and is sensitive to mixture variables.

13D. Containers and Packaging

PB82-266859 PC **A02**/MF **A01**
Kajima Inst. of Construction Technology, Tokyo (Japan).

Measurement of Clearance between Steel Plate and Ground by Neutron Scattering, Nondestructive Survey of Foundation Configuration of Oil-Storage Tank,
Tsuyoshi Yamamoto, Masatoshi Ishitani, and Michio Tsuchihiro. Mar 82, 13p KICT-38

A clearance measuring device utilizing neutrons was developed, and displayed the required functions during repeated testing in the laboratory and in situ. It is now being used in practical applications in surveys and in construction control during tank foundation adjustment, and has been used with remarkable success. This report illustrates the principle and characteristics of this method of measurement and also introduce some actual examples.

13E. Couplings, Fittings, Fasteners, and Joints

DE82014165 MF **A01**
Sandia National Labs., Livermore, CA.
Microstructural Origin of the Skeletal Ferrite Morphology of Austenitic Stainless Steel Welds.
J. A. Brooks, J. C. Williams, and A. W. Thompson. Apr 82, 36p SAND-82-8667
Contract AC04-76DP00789
Best available copy from document source. Available in microfiche only.

Scanning transmission electron microscopy was conducted on welds exhibiting a variety of skeletal, or vermicular ferrite morphologies in addition to one lathy ferrite morphology. These ferrite morphologies result from primary ferrite solidification followed by a solid state transformation upon cooling. During cooling, a large fraction of the ferrite transforms to austenite leaving a variety of ferrite morphologies. Comparison of composition profiles and alloy partitioning showed both the skeletal and lathy ferrite structures result from a diffusion controlled solid state transformation. However, the overall measured composition profiles of the weld structure are a result of partitioning during both solidification and the subsequent solid state transformation.

DE82016036 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Microstructural Analysis of Austenitic Stainless Steel Welds and Their Modification During Laser Welding.
S. A. David, J. M. Vitek, and W. H. Smith. May 82, 30p ORNL/TM-8276
Contract W-7405-ENG-26
Microfiche only after original copies are exhausted.

The microstructure of austenitic stainless steel weld metal containing a duplex structure was fully characterized and its mode of formation explained. Four distinct ferrite morphologies were identified in type 308 stainless steel weld metal: vermicular, lacy, acicular, and globular. The first three ferrite types are related to transformations during and after solidification, and the fourth is related to the shape instability of the residual ferrite. Solidification behavior of type 308 stainless steel welds at high cooling rates was investigated with a high-power laser system. The welds were made at speeds ranging from 13 to 63 mm/s. The welds made at 13 mm/s contained microstructures ranging from a fully austenitic structure at the root of the weld to a ferrite plus austenitic duplex structure at the crown. However, the welds made at 25 and 63 mm/s contained a nearly fully austenitic structure with less than 1% ferrite, and third-phase particles rich in manganese and silicon were also found. The fully austenitic stainless steel welds were free of any cracking. The results are explained in terms of excessive undercooling at the tip of the ferrite cells at rapid solidification rates. This undercooling changes the mode of freezing from primary delta-ferrite to primary austenite. (ERA citation 07:044178)

13F. Ground Transportation Equipment

AD-A118 718/6 PC **A03**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
Verification Tests of the Lectra Motors Corporation Lectra 2+2.
Rept. for 20 Oct 80-3 Apr 81,
Edward J. Dowgiallo, Jr., Ivan R. Snellings, and Robert D. Chapman. Apr 82, 34p Rept no. MERADCOM-2356
Contract EC-77-A-31-1042

The Lectra 2+2 manufactured by Lectra Motors Corporation was tested at MERADCOM as part of the Department of Energy project to verify conformity to performance standards of electric vehicles. It is standard Datsun 310 which has been converted to an electric vehicle. It is powered by 18 6-V batteries through an SCR controller, by Cableform, to a 22-hp, series-wound d.c. motor. It is equipped with a four-speed manual transmission, front disc brakes with drum in the rear. It is not equipped with regenerative braking.

AD-A118 741/8 PC **A03**/MF **A01**
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
Verification Test of the Battronic Truck Volta Electric Pickup.
Rept. for Jul 80-Jan 81,
Edward J. Dowgiallo, Jr., Ivan R. Snellings, and Robert D. Chapman. Apr 82, 40p Rept nos. MERADCOM-2357, CONS/0421
Contract EC-77-A-31-1042

The Volta Pickup is an electric 1/2-ton truck manufactured by the Battronic Truck Co. It was tested by MERADCOM at Fort Belvoir, Virginia as part of a Department of Energy project to verify conformity to performance standards of electric vehicles. The verification test results are presented in this report. The Volta Pickup is powered by 24 6-V lead-acid batteries, has a 38 hp series wound d.c. motor, SCR chopper controller, regenerative braking, and a 2-speed Helical gear transmission. (Author)

DE82013934 MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Environmental Control Subsystems for Electric and Hybrid Vehicles. A Study Evaluation Report.
B. Zeldin. 15 Apr 82, 42p DOE/CS/54209-7, JPL-PUB-82-17
Contract AI01-78CS54209
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Results of parallel contracts awarded by the US Department of Energy's Electric and Hybrid Vehicle Program to TRW and MTI are summarized. Both contractors conducted studies to compare all known heating and cooling mechanisms and methods for the purpose of determining those best suited for the Environmental Control Subsystem (ECS), a nonpropulsion technology for electric and hybrid vehicles. Rationale is presented for recommendations concerning the further development of ECS candidates that are significant departures from current ECS technology. Ranking data and methods are excerpted from the contractor's final reports and are evaluated. Recommendation is given for further study of the split absorption heat pump/refrigerator ECS scheme developed by MTI, leading to a proof-of-concept development.

DE82902034 PC **A02**/MF **A01**
Florida Univ., Gainesville. Inst. of Food and Agricultural Sciences.
Your Car and its Fuel Efficiency.
M. Harrison. Oct 80, 4p NP-2902034

Measures to realize optimum fuel efficiency from an automobile are discussed. Points to observe in selecting a new car, selecting the type of tires best for fuel efficiency, and maintaining the car regularly are discussed. Eleven tips are given on operating the vehicle for the best fuel economy. (ERA citation 07:044019)

PB82-255647 PC **A05**/MF **A01**
West Virginia Univ., Morgantown. Harley O. Staggers National Transportation Center.
Power and Energy Measurement on Morgantown People Mover System.
Final rept. Jul 80-Nov 81,
Robert L. McConnell, and Ray J. Kuniak. Dec 81, 97p UMTA-WV-11-0003-82-1

The Morgantown People Mover (MPM) is one of the most technologically advanced automated ground transportation systems in the world. It is a fully automated guideway transit (AGT) system under complete computer control. There are 8.7 miles of single lane guideway with five passenger stations and two maintenance stations. The vehicles are powered from a 575 volt three phase power rail that runs immediately above the guide rail throughout the system. The overall objectives of this study were the measurement of the power to determine real time power demand by the vehicle; and the development of a load flow analysis on the power system with several vehicles operating. This study developed a system of measuring and recording power demand on the MPM system. Vehicle power demand profiles are presented for some sections of the guideway.

PB82-258708 PC **A03**/MF **A01**
SYSTAN, Inc., Los Altos, CA.
Shared-Ride Taximeters: State-of-the-Art and Future Potential.
Final rept. 1978-81,
May 82, 44p UMTA-MA-06-0049-81-15, DOT-TSC-UMTA-82-10
Contract DOT-TSC-1416

A shared-ride taximeter is a means of calculating passenger fares for shared-group, or exclusive-ride taxi service. This report describes shared-ride taximeter equipment and operating issues and then identifies the state-of-the-art and the future potential for shared-ride taximeter services. Data were collected as the evaluation contractor to the jointly sponsored U.S. and California Department of Transportation's demonstration project to test shared-ride taximeter services, from U.S. and foreign taximeter manufacturers and from related shared-ride taxi research. General conclusions, specific equipment findings, and future recommendations are identified.

PB82-258716 PC **A04**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Escalator Design Features Evaluation.
Final rept. Jul 80-Mar 82,
W. F. Zimmerman, and G. K. Deshpande. May 82, 53p UMTA-MA-06-0025-81-3, DOT-TSC-UMTA-81-66
Contract DTRS57-80-X-00103

This study provides an evaluation of the effectiveness of several special design features associated with escalators in rail transit systems. The objective of the study was to evaluate the effectiveness of three escalator design features: (1) mat operation in a single direction and reversible operation; (2) two-speed option (90 or 120 or both); and (3) the use of extended flat steps. The study evaluated these design features based on the impact of each on capital and operating costs, traffic flow, and safety.

PB82-258856 PC **A02**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Standards Development and Support Branch.
Testing of the Mack ETSA-676 at MVEL,
Alex Azary. Apr 82, 11p EPA-AA-SDSB-82-10

This report discusses the results of testing a Mack heavy-duty diesel engine, model ETSA-676. This engine was tested as part of the EMA/EPA cooperative test program designed to analyze lab-to-lab variability in emissions measurements and to assess how well the emissions data generated at EPA correlates with data acquired through testing at other laboratories. Also reviewed are some problems encountered during the course of testing. Recommendations for improved procedures also are presented.

PB82-259037 PC **A07**/MF **A01**
Wyle Labs., El Segundo, CA.
National Roadway Traffic Noise Exposure Model (NRTNEM) - User's Manual.
Final rept.
Jan 82, 143p WR-80-37-A, EPA-550/9-82-201-A
Contract EPA-68-01-3948
See also Programmer's Manual, PB82-259045.Portions of this document are not fully legible.

The National Roadway Traffic Noise Exposure Model (NRTNEM) is comprised of a collection of on-line datasets, some containing programs and others containing data. The manual describes the job submission proce-

dures required to run the NRTNEM as it existed on the NCC (EPA's National Computer Center) in December, 1981, under user ID EPADYN. The NRTNEM actually consists of two models: The General Adverse Response Model ('GAR'), and the Single Event Model ('SEM'). Only one of them can be executed by a job at a time. The Programmer's Manual describes the NRTNEM system in more detail to facilitate program maintenance. The NRTNEM was designed for and runs on an IBM/370 computer under MVS, with TSO (the Time Sharing Option) and WYLBUR, the latter two being conversational direct-access systems.

PB82-259045 PC **A17**/MF **A01**
Wyle Labs., El Segundo, CA.
National Roadway Traffic Noise Exposure Model (NRTNEM) - Programmer's Manual .
Final rept.
Dec 81, 381p WR-80-37-B, EPA-550/9-82-201-B
Contract EPA-68-01-3948
See also User's Manual, PB82-259037.Portions of this document are not fully legible.

The National Roadway Traffic Noise Exposure Model (NRTNEM) is comprised of a collection of on-line datasets, some containing programs and others containing data. This manual describes the NRTNEM system as it existed on the NCC (EPA's National Computer Center) in December 1981, under user ID EPADYN. NRTNEM actually consists of two models: The General Adverse Response Model ('GAR'), and the Single Event Model ('SEM'). Only one of them can be executed by a job at a time. The User's Manual describes job submission procedures. This manual describes the NRTNEM system in more detail so as to facilitate program maintenance. This manual is organized from two points of view: present first those items the user first comes into contact with, and go from the general to the specific. Accordingly, the general properties of files and datasets are described first, and the coding details are last.

PB82-259060 PC **A06**/MF **A01**
Energy Resources Co., Inc., Vienna, VA.
Railyard Noise Exposure Model Source Submodel (RYNEM-S). Volume 1. Description of RYNEM-S Model.
Jan 82, 102p EPA-550/9-82-203-A
Contract EPA-68-01-6093
See also Volume 2, PB82-259078.
Also available in set of 3 reports PC E99, PB82-259052.

This volume presents an overview of the RYNEM-S model. The basic philosophy of the model is discussed and the relevant equations used in the computations are presented. This volume is written for those who need to know what the model is like. It does not go into detail of how each computation is done in the program, nor does it teach the user how to run the model. It presupposes some familiarity with the EPA noise terminology, as is covered by the 'EPA Levels' document. The reader is advised to peruse the Railroad Background document for other terminology used without explanation.

PB82-259078 PC **A04**/MF **A01**
Energy Resources Co., Inc., Vienna, VA.
Railyard Noise Exposure Model Source Submodel (RYNEM-S). Volume 2. RYNEM-S User Manual.
Final rept.
Jan 82, 69p EPA-550/9-82-203-B
Contract EPA-68-01-6093
See also Volume 1, PB82-259060, and Volume 3, PB82-259086.
Also available in set of 3 reports PC E99, PB82-259052.

This volume presents a cookbook approach to the execution of the RYNEM-S model. Its intended audience is those who will exercise the model. It assumes familiarity with Volume 1, i.e., the user knows the quantities he inputs, and he knows the quantities printed out. For obvious reasons, the explanations incorporated in Volume 1 are not repeated. While it does not presume expertise with the EPA IBM computer system, it does assume the user can follow the instructions presented in this volume to the letter.

PB82-259086 PC **A06**/MF **A01**
Energy Resources Co., Inc., Vienna, VA.
Railyard Noise Exposure Model Source Submodel (RYNEM-S). Volume 3. RYNEM-S Programmer Manual.
Final rept.
Jan 82, 105p EPA-550/9-82-203-C
Contract EPA-68-01-6093
See also Volume 2, PB82-259078.
Also available in set of 3 reports PC E99, PB82-259052.

This volume describes the structure of the RYNEM-S and the model's program source code. It is not meant to teach the reader how to run the program. Execution of the model is described in Volume 2. It assumes the reader has digested the contents of Volume 1. The intended audience is the programmer who needs to maintain the program and make changes to the source code. A strong knowledge of standard IBM FORTRAN IV language is assumed.

PB82-260118 PC **A04**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Rail Systems Center.
Power Rate Structure Aspects of Energy Cost for Rapid Transit Systems.
Final rept. 1 Jul 80-30 Nov 81,
Richard A. Uher, and Onkar Sharma. Jun 82, 61p UMTA-PA-06-0059-82-1
Grant DOT-UMTA-PA-06-0059

In electric rail systems in the United States, energy cost is generally determined by the components of the energy use pattern and the power rate structure of the serving utilities. The components of the energy use pattern, which are power facilities, energy consumption, and power demand, are principally influenced by equipment and system design and operating practices that are controllable within limits by management. The power rate structure may be a matter of negotiations between the transit property and the electric utilities serving it. The subject of this report is a result of an investigation of the power rate structure of the utilities serving U.S. rapid rail transit properties. The results are presented in a way which can be used in energy management programs to develop energy cost reduction strategy models. A survey was conducted on the ten rapid rail transit properties in the United States.

PB82-260431 PC **A14**/MF **A01**
California State Div. of Mass Transportation, Sacramento.
Wheelchair Securement on Bus and Paratransit Vehicles.
Interim rept. no. 1,
Carl F. Stewart, and Herbert G. Reinl. Apr 81, 307p DMT-074, UMTA-CA-06-0098-81-1
Grant DOT-UMTA-CA-06-0098
See also PB81-104655.

After entering a public transit bus, most wheelchair users cannot readily transfer from chairs to regular passenger seats. Even for those who can make the transfer, there is no place for them to store their chairs during transit. Space and a wheelchair securement system must be provided on public transit buses so that both wheelchair users and other passengers can be transported safely while the wheelchair users remain in their chairs. This report presents and discusses data from 42 dynamic crash tests conducted with wheelchairs, occupied by anthropomorphic dummies, to determine the performance of wheelchairs using 12 different types of securement systems. Both manual and electric powered chairs were used in the tests. Forward, rearward, and sidefacing orientations were represented.

PB82-262858 PC **A03**/MF **A01**
National Inst. for Transport and Road Research, Pretoria (South Africa).
Under-ride Protectors for Commercial Vehicles,
J. C. Hillman. Dec 80, 27p RV/3/80

In 1978 there were 63 fatal and 129 serious injury accidents involving rear end impacts between passenger cars and commercial vehicles. It is highly likely that at least 10 per cent of these accidents suffered increased severity due to the cars under-riding the lead vehicle with consequent intrusion into the passenger compartment. Some form of under-ride protector could reduce the severity of this type of accident and this report examines the physical requirements for such a device based on the characteristics of the passenger car population of South Africa. The dimensions of a suitable protector are recommended but it is apparent that improving the conspicuity of the rear ends of trucks could be a more effective measure by reducing the number of such accidents in the first place.

PB82-263005 PC **A06**/MF **A01**
Booz-Allen and Hamilton, Inc., Bethesda, MD.
U.S. Rapid Railroad Door Systems Assessment Report.
Final rept.,
R. T. Lerew, J. T. Pekarcik, and R. D. Smith. Jun 82, 104p 09073-113-002, UMTA-IT-06-0242-81-1
Contract DOT-UMTA-60-80-C-71023
Portions of this document are not fully legible.

This report presents the results of an assessment of railcar door system reliability. It addresses the question of whether the rail transit industry is experiencing excessive door system reliability problems, and if so, what options are available to improve the performance reliability. A door system reliability baseline was developed and a comparison of six U.S. transit systems' relative door system reliability was performed. The six transit systems studied were BART, CTA, MARTA, MBTA, NYCTA, and WMATA. The study addresses the general factors influencing door system reliability and the site-specific problems uncovered during the on-site investigation. The report provides recommendations regarding specific problems identified during the study.

PB82-265034 PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Changes to the Motor Vehicle Recall Program Could Reduce Potential Safety Hazards.
24 Aug 82, 67p GAO/CED-82-99, B-206637

Nearly 128 million vehicles, tires, and other related items have been recalled because of safety defects, thereby reducing their potential to cause accidents. In many cases the National Highway Traffic Safety Administration's defect investigation process has taken years to complete. Meanwhile, owners continue to drive vehicles that could be defective. About half of the millions of owners receiving recall letters fail to respond by having their safety defects corrected. Some owners do not perceive the defects as problems or do not believe the recalls are important. GAO found that nearly all the recall letters it reviewed were written at too high a reading level and were difficult to understand. Lowering the reading level could increase owner response rates.

PB82-266826 PC **A06**/MF **A01**
Human Factors Research, Inc., Goleta, CA.
The Effect of Wide-Angle Headlight Illumination on Driver Performance.
Final rept. Sep 77-May 79,
John O. Merritt, Martin Helander, Charles Abrams, and James C. Miller. May 79, 108p TR-2703, DOT-HS-806 186
Contract DOT-HS-7-01724

The purpose of this study was to identify possible improvements in the present U.S. low beam headlight system, using an instrumented passenger car to evaluate the effect of experimental wide-angle low beam lighting on various driver performance measures--speed, brake pressure, longitudinal acceleration, steering wheel position, lateral acceleration, lateral lane position, and electrodermal response (GSR), for over 1,000 vehicle miles (30 hours) on a winding rural highway at night.

PB82-917000 Subscription
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad/Highway Accident Reports.
Irregular repts.
1982, open series
Paper copy available on subscription, North American Continent price $90.00/year; all others write for quote. Single copies also available in paper or microfiche.

This subscription offers publications called Transportation Special Reports - this category includes all modes of Safety Studies, Special Investigation Reports, Safety Reports and Railroad/Highway Accident Reports.

13H. Industrial Processes

AD-A118 632/9 PC **A06**/MF **A01**
Coates (J.F.), Inc., Washington, DC.

Metric Use in the Tool Industry. A Status Report and a Test of Assessment Methodology.
Final rept.,
W. Edward Cushen. 20 Apr 82, 114p
Contract USMB-1-0581

This study served a dual purpose of testing the most promising methods of assessing metric status in the United States while providing an assessment of the current status and progress of metrication activities of the machine tool industry. The machine tool industry provides capital equipment for other manufacturing industries including the automotive, aerospace, construction, and farm machinery industry. It is a small but critical segment of the national economy. There have been a number of studies of industrial metrication, but they dealt with broad categories of industry and provided little detailed information about specific industries or about the process. This study draws directly on the experience of industry companies and on data from many public and private sources. Some of the major findings are: (1) Metrication is progressing slowly but steadily in the U.S. Machine Tool Industry. (2) The U.S. Machine Tool Industry meets overseas demand and the small domestic demand for metric tools by building metric-capable machines. (3) The serious decline of the U.s. share of the world market has been somewhat masked by the fact that the dollar volume of U.s. overseas sales has increased. (4) Because of the paucity of data, assessment of metric status in specific industries cannot be handled through econometric modeling or aggregation of massive amounts of statistical data. (Author)

AD-A118 776/4 PC **A07**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.
Heat Source - Materials Interactions during Fusion Welding.
Annual technical rept. no. 2,
T. W. Eagar, A. Block-Bolten, C. Allemand, D. Hardt, and J. Katz. 30 Apr 82, 134p
Contract N00014-80-C-0384
See also AD-A107 717.

This report summarizes the second year of research involving spectrographic and thermodynamic studies of vapor emission from welding arcs, infrared measurement of the weld pool surface temperature, electroslag welding of titanium, fracture toughness of HY-80, sensors for weld automation and laser welding of aluminum. All results are preliminary except for preprints of five technical papers which have been submitted for publication. (Author)

DE82014184 MF **A01**
Sandia National Labs., Livermore, CA.
Computer Simulation of Upset Welding.
J. R. Spingarn, W. E. Mason, and J. C. Swearengen. Apr 82, 26p SAND-82-8663
Contract AC04-76DP00789
Best available copy from document source. Available in microfiche only.

Useful process modeling of upset welding requires contributions from metallurgy, welding engineering, thermal analysis and experimental mechanics. In this report, the significant milestones for such an effort are outlined and probable difficult areas are pointed out. Progress to date is summarized and directions for future research are offered. With regard to the computational aspects of this problem, a 2-D heat conduction computer code has been modified to incorporate electrical heating, and computations have been run for an axisymmetric problem with simple viscous material laws and d.c. electrical boundary conditions. In the experimental endeavor, the boundary conditions have been measured during the welding process, although interpretation of voltage drop measurements is not straightforward. The ranges of strain, strain rate and temperature encountered during upset welding have been measured or calculated, and the need for a unifying constitutive law is described. Finally, the possible complications of microstructure and interfaces are clarified.

DE82014559 MF **A01**
Lawrence Livermore National Lab., CA.
Order of Magnitude Improvement in Thermal Stability with Use of Liquid Shower on a General Purpose Measuring Machine.
J. B. Bryan, D. L. Carter, R. W. Clouser, and J. H. Hamilton. 6 May 82, 18p UCRL-87591, CONF-820641-1
Contract W-7405-ENG-48
Workshop on Precision Machining Society of manufacturing engineers, St Paul, MN, USA, 6 Jun 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Over the past 25 years, LLNL has been developing and contributing to the technology of precision machining and diamond-turning. Advancement of the accuracy of machine tools has made it necessary to upgrade inspection tools as well. This paper describes the upgrading of a Moore Special Tool Co., No. 3 Measuring Machine. The results show that the liquid shower approach can be engineered to provide a simple and practical system having a dramatic improvement in thermal stability. (ERA citation 07:044366)

N82-29723/5 PC **A06**/MF **A01**
ARCO Solar, Inc., Chatsworth, CA.
Automated Solar Panel Assembly Line.
Final Report.
H. Somberg. May 81, 101p NASA-CR-169206, DOE/JPL-955278-81/5
Contracts JPL-955278, NAS7-100
Sponsored in Part by Doe; Prepared for JPL.

The initial stage of the automated solar panel assembly line program was devoted to concept development and proof of approach through simple experimental verification. In this phase, laboratory bench models were built to demonstrate and verify concepts. Following this phase was machine design and integration of the various machine elements. The third phase was machine assembly and debugging. In this phase, the various elements were operated as a unit and modifications were made as required. The final stage of development was the demonstration of the equipment in a pilot production operation.

PB82-259912 PC **A03**/MF **A01**
Food and Drug Administration, Silver Spring, MD. Bureau of Medical Devices.
Evaluation of Compliance Program 7378.008, Inspection of Medical Device Manufacturers, Fiscal Year 1981.
Final rept. 1 Oct 80-30 Sep 81,
Howard A. Press. Aug 82, 26p FDA/BMD-82/82
See also PB82-215732.

This evaluation report summarizes the findings of the FY 81 Device Good Manufacturing Practice (GMP) Compliance Program. Inspections were conducted at 1,403 establishments.

PB82-261694 Not available NTIS
National Bureau of Standards, Washington, DC.
Radiation Levels Associated with the Electron-Beam Metallization Process.
Final rept.,
K. F. Galloway, and S. Mayo. May 79, 5p
Pub. in Solid State Technology, p96-100 May 79.

Ionizing radiation exposure is a natural consequence of the electron-beam metallization process used in device fabrication. Techniques for obtaining the radiation levels associated with electron-beam metallization and the levels for some typical situations are given in this paper. In addition, the consequences of this process-related radiation exposure are briefly discussed.

PB82-266438 PC **A24**/MF **A01**
Hindustan Machine Tools Ltd., Bangalore (India).
National Workshop on Advanced Production Engineering for Public Enterprises, Bangalore, April 1982.
B. S. Ramananda. Apr 82, 569p
Portions of this document are not fully legible.

The subjects in this workshop encompass the latest as well as future technologies in the field of Production Engineering. The subjects range from CNC Machining, Metal Forming to those pertaining to mass production, quality engineering and automation, including the space-age topics CAD and CAM. The non-traditional machining methods have been included to highlight their important role in modern Production Engineering practices.

PB82-266891 PC **A03**/MF **A01**
AGA Gas Div., Lidingoe (Sweden).
The Problem of Ozone in Gas-Shielded Arc Welding.
Sep 80, 32p GM-144E

The report takes up such subjects as how ozone is formed and how the ozone level can be reduced during TIG welding of stainless steel and aluminum and during MIG welding of aluminum and of ordinary mild structural steel with a short-circuiting or mixed arc.

PB82-811258 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Metal Drawing. 1964-July, 1982 (Citations from the NTIS Data Base).
Sep 82, 145p
Supersedes PB81-807075 and PB80-808116.

Citations include application of ultrasonic energy, effects of friction, lubricants and lubrication, and deformation. (This updated bibliography contains 136 citations, 11 of which are new entries to the previous edition.)

PB82-811308 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrodeposition. 1978-May, 1981 (Citations from the NTIS Data Base).
Sep 82, 276p

The technology of electrodeposition and electroforming is cited. Topics include applications, safety, processes, operations, coatings, films and platings. (This updated bibliography contains 267 citations, none of which are new entries to the previous edition.)

PB82-811316 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Electrodeposition. June, 1981-July, 1982 (Citations from the NTIS Data Base).
Sep 82, 111p
Supersedes PB81-807133 and PB80-807555.

The technology of electrodeposition and electroforming is cited. Topics include applications, safety, processes, operations, coatings, films, and platings. (This updated bibliography contains 102 citations, all of which are new entries to the previous edition.)

PB82-875378 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pressure Casting of Nonferrous Alloys. 1966-September, 1982 (Citations from the Metals Abstracts Data Base).
Rept. for 1966-Sep 82.
Sep 82, 162p
Supersedes PB81-881591.

This bibliography contains citations concerning pressure casting of non-ferrous metals. Casting properties of aluminum, copper, magnesium, and nickel alloys are emphasized. The casting of various automotive parts such as pistons and engine blocks are included. (This updated bibliography contains 257 citations, 65 of which are new entries to the previous edition.)

PB82-875949 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Extrusion of Polystyrenes, Polypropylenes, and ABS Resins. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 98p
Supersedes PB80-851926.

This bibliography contains citations concering the state of the art in extrusion technology of polystyrenes, polypropylenes and ABS plastics. Developments and innovations in extrusion equipment, dies, and accessories are presented. Chemical and physical properties of the processed materials are included. (This updated bibliography contains 84 citations, 23 of which are new entries to the previous edition.)

PB82-875956 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.

Continuous Metal Casting. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 126p
Supersedes PB80-851785.

This bibliography contains citations concerning the technology of continuous casting of various metals and alloys. Energy efficiency, structure changes, lubrication, heat transfer, electromagnetic mold design and operation, and surface quality control are discussed. Equipment variations and innovations, and material handling discussions are also presented. (This updated bibliography contains 131 citations, 14 of which are new entries to the previous edition.)

PB82-876244 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Underwater Welding of Pipelines and Offshore Drilling Platforms. 1966-September, 1982 (Citations from the Metals Abstracts Data Base).
Rept. for 1966-Sep 82.
Sep 82, 134p
Supersedes PB81-871188.

This bibliography contains citations concerning underwater offshore welding development, research, and innovations. Welding of offshore drilling platforms and submerged pipelines is included. The development of explosive welding techniques for pipeline connections and repair is emphasized, as is hyperbaric welding and inert gas shielded welding. (This updated bibliography contains 199 citations, 36 of which are new entries to the previous edition.)

13I. Machinery and Tools

AD-A118 583/4 PC **A07**/MF **A01**
David W. Taylor Naval Ship Research and Development Center, Bethesda, MD.
Calculation of Contact Pressures and Frictional Effects on Mechanical Contact Surfaces by Finite Element Methods with Application to Fretting Damage Prediction,
Douglas E. Lesar. Aug 82, 139p Rept no. DTNSRDC-82/033

Contact stresses, contact forces, relative contact surface displacements, and the dissipative effects of friction are computed, by the finite element method, for various two- and three-dimensional contact problems. The finite element technique is verified by analysis of several two-dimensional frictionless contact problems; the Hertz contact of two cylinders, a rigid sleeve/elastic shaft shrinkfit, and an elastic sleeve/elastic shaft shrinkfit. In these cases the finite element calculations compare favorably to existing solutions. The contact analysis capability is extended to frictional contacts by considering plane stress and axisymmetric contact problems with friction and slip, for which reasonable results are produced. The capability is further extended to complex three-dimensional contacts by an effort to determine the contact forces and frictional dissipation taking place in the cyclic bending of a shrinkfit assembly. This work demonstrates that advanced nonlinear finite element methods can be used to solve a variety of mechanical engineering problems involving unlubricated contact surfaces and the effects of friction. (Author)

DE82013237 MF **A01**
Bendix Corp., Kansas City, MO.
Equipment for Drilling Miniature Holes.
L. K. Gillespie. Apr 81, 62p CONF-810427-3
Contract AC04-76DP00613
SME international tool and manufacturing engineering conference and exposition, Detroit, MI, USA, 27 Apr 1981, Portions of document of illegible.
Best available copy from document source. Available in microfiche only.

Miniature holes are produced on 16 different types of mechanical drilling equipment. Each equipment type has significant advantages for a specific type of part. The basic capabilities vary greatly between equipment types. Some produce very precise holes and others produce very high volumes of commercial tolerance holes. At the present time machines are available for mechanicaly drilling up to 100,000 miniature holes per hour. Lasers currently are drilling as many as 15,000,000 ultra-miniature holes per hour.

DE82014955 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Design Guidance for Fracture-Critical Components at Lawrence Livermore National Laboratory.
R. D. Streit. 3 Mar 82, 17p UCRL-53254
Contract W-7405-ENG-48

Fracture is an important design consideration for components whose sudden and catastrophic failure could result in a serious accident. Elements of fracture control and fracture mechanics design methods are reviewed. Design requirements, which are based on the consequences of fracture of a given component, are subsequently developed. Five categories of consequences are defined. Category I is the lowest risk, and relatively lenient design requirements are employed. Category V has the highest potential for injury, release of hazardous material, and damage. Correspondingly, the design requirements for these components are the most stringent. Environmental, loading, and material factors that can affect fracture safety are also discussed. (ERA citation 07:044363)

N82-29607/0 PC **A04**/MF **A01**
Cincinnati Univ., OH. Dept. of Mechanical and Industrial Engineering.
On Finite Element Stress Analysis of Spur Gears.
S. H. Chang, and R. L. Huston. Jul 82, 53p NASA-CR-167938, NAS 1.26:167938
Grant NSG-3188

Spur gear stress analysis results are presented for a variety of loading conditions, support conditions, root radii, and rime thicknesses. These results are obtained using the SAP-IV finite element code. The maximum stresses, occurring at the root surface, substantially increase with decreasing rim thickness for partially supported rims (that is, with loose fitting hubs). For fully supported rims (that is, with tight fitting hubs), the root surface stresses slightly decrease with decreasing rim thickness. The fillet radius has a significant effect upon the maximum stesses at the root surface. These stresses increase with decreasing fillet radius. Finally, the fillet radius has little effect upon the internal root section stresses.

PATENT-4 329 938 Not available NTIS
Department of the Navy, Washington, DC.
Evaporator Tool with Remote Substrate Reorientation Mechanism.
Patent,
Guenter H. Mang. Filed 3 Oct 80, patented 18 May 82, 6p AD-D009 622/2, PAT-APPL-6-193 868
Supersedes PAT-APPL-6-193 868, AD-D007 836.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

An evaporation fixture for sequentially vapor depositing dielectric or other materials on the surface of a substrate at various slant and rotational angles without opening the fixture. A connecting rod extends from the exterior of the evaporation fixture to the interior of the fixture where it is connected to a cam mechanism. The cam mechanism is in turn mechanically coupled to a reorientation ring that is concentric with the substrate holding ring of the fixture. A slot in the reorientation ring is in engagement with the substrate holding mechanism connecting pin. Movement of the connecting rod at the end exterior to the evaporation fixture causes movement of the reorientation ring with respect to the holding ring and by means of the slot-pin coupling causes rotational and angular reorientation of the substrate with respect to the evaporated material. (Author)

PB82-260902 PC **A02**/MF **A01**
Pacific Northwest Forest and Range Experiment Station, Portland, OR.
Improved Adapter for Increment Borer Ratchet Assembly.
Forest Service research note,
Francis R. Herman. Nov 72, 6p FSRN-PNW-192

A stronger adapter for small-diameter increment borer ratchet assemblies can be fabricated easily. A thicker walled adapter can be machined, or a seamless carbon-steel sleeve can be shrunk around a custom-fitted standard square-holed sleeve. Mechanics' hand cream is recommended for lubricating during increment borer use.

PB82-875865 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Packaging Machines. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 275p
Supersedes PB81-855371.

This bibliography contains citations concerning the design and applications of processing and packaging machinery and equipment. Automatic and programmable process controls for packaging machinery are considered. (This updated bibliography contains 348 citations, 281 of which are new entries to the previous edition.)

13J. Marine Engineering

AD-A118 685/7 PC **A03**/MF **A01**
Defence Research Establishment Atlantic, Dartmouth (Nova Scotia).
Propeller Cavitation Noise Investigations in a Free-Field Environment.
Technical memo.,
L. John Leggat. Jun 82, 37p Rept no. DREA-TM-82/E
Abstract in French.

Cavitation is the dominant source of noise for cavitating propellers. It is generally agreed that the growth and collapse of cavitation bubbles creates a monopole acoustic source mechanism, which radiates sound in an omnidirectional pattern from the oscillating bubble. Hydrodynamic flows about propellers produce other types of cavitation besides bubble cavitation. Vortex cavitation occurs in the concentrated tip and hub vortices, and sheet cavitation can occur at the propeller blade leading edge. Each of these types of cavitation may have different acoustic source strengths and source spectra. A propeller drive apparatus has been built at the Acoustics Barge at the Defence Research Establishment Atlantic. The fully instrumented barge is located in Bedford Basin, a large soft-bottom saltwater body of water near Halifax. A stationary propeller drive pod and near and far-field hydrophones are fixed to and suspended from the barge. Propellers designed to produce various types of cavitation have been tested in this facility.

AD-A118 690/7 PC **A05**/MF **A01**
ARINC Research Corp., Annapolis, MD.
System Engineering Analysis of Feed and Condensate System Installed on LHA-1 and LPH-2 Class Ships.
Research publication,
R. M. Evans. Jul 82, 82p Rept no. 2657-01-3-2754
Contract N00189-81-D-0126

The goal of an engineered operating cycle (EOC) program is to effect an early improvement in the material condition of ships at an acceptable cost, while maintaining or increasing their operational availability during an extended operating cycle. In support of this goal, system engineering analyses (SEAs) are being conducted for various ship classes on selected mission-critical systems and subsystems that have historically exhibited relatively high maintenance burdens. This report documents the SEA for the Feed and Condensate Systems on LHA-1 and LPH-2 Class ships.

AD-A118 703/8 PC **A03**/MF **A01**
Center for Naval Analyses, Alexandria, VA. Naval Studies Group.
Western European and NATO Navies, 1981.
Professional paper,
Stephen S. Roberts. Jul 82, 35p Rept no. CNA-PP-326
Contract N00014-76-C-0001

The first paper in this series surveyed the history of the navies of Western Europe and Canada from the creation of NATO to the end of 1980, with emphasis on the evolution of their force structures. This paper will examine the current force procurement plans of each navy as of the end of 1981, to the extent that they have

been made public, and estimate their impact on future force structure. One theme is common to nearly all of these programs: They are replacement programs designed to maintain current force levels while upgrading technology, not to increase the size of the fleet or change its basic structure. The countries will be surveyed alphabetically, ending with the United Kingdom, whose navy has had a more traumatic year than most. Note that Finland has been added to this discussion.

AD-A118 771/5 PC **A05**/MF **A01**
ARINC Research Corp., Annapolis, MD.
System Engineering Analysis of Air Conditioning, Heating, and Ventilation Systems Installed on LHA-1 and LPH-2 Class Ships,
J. M. O'Connor. Jul 82, 76p Rept no. 2657-01-4-2755
Contract N00189-81-D-0126

The analysis documented herein is specifically applicable to the Air Conditioning, Heating, and Ventilation Systems--ship's work authorization boundary (SWAB) groups 511-1, 512-1, 513-1, 514-1, 514-2, and 514-3--installed on LHA-1 and LPH-2 Class ships. The analysis considers only the systems and equipments installed and the documentation effective as of 22 April 1981. This system was selected for analysis by PERA (ASC) on the basis of its mission criticality and historical maintenance burden. (Author)

DE82015222 MF **A01**
Graham and Schlageter, Inc., Chicago, IL.
Economic Feasibility of Sail Power Devices on Great Lakes Bulk Carriers.
24 Mar 82, 10p DOE/R5/10288-1
Contract FG02-81R510288
Portions of document are illegible.
Available in microfiche only.

Progress is reported in a project to determine whether retro-fitting existing Great Lakes bulk carriers with auxiliary sail powering devices is economically feasible. The approach being used is to apply known technology both in terms of sail devices and calculation methods to determine the amount of fuel that can be saved and the probable cost of the sail device. Progress includes the identification and collection of data needed to determine the state of the art as well as to model the problem. Several sail powering devices were compared and an unstayed cat rig was chosen for further analysis and its performance characteristics were incorporated into a computer model, which is flow charted.

PATENT-4 330 895 Not available NTIS
Department of the Navy, Washington, DC.
Stabilizer for Reducing Motion of an Object Disposed in a Fluid.
Patent,
Stephen Putman, and Frederick L. Erickson. Filed 1 Oct 79, patented 25 May 82, 10p AD-D009 629/7, PAT-APPL-6-080 761
Supersedes PAT-APPL-6-080 761, AD-D006 904.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The patent relates to a stabilizer or drogue, packageable in a minimal volume, which can be automatically deployed to dampen horizontal, vertical and rotational motion of a device, such as a hydrophone, operating in a relatively viscous fluid. The stabilizer is disposed on a line or cable connected between the device and a surface float, and includes a horizontally oriented fabric fin extended and supported by a plurality of rigid arms, and a plurality of vertically oriented perpendicular fabric fins connected to, extend and supported by the arms and by a rigid vertical tube slidably disposed on the line. The arms are adjacently pivotably connected to a rigid body loaded by the device. Before deployment, the fabric is wrapped around the tube, and the arms are in a raised position substantially adjacent and parallel to the line and the tube, all stowed within a cylindrical container having an open end. The closed end of the container is fixedly connected to the line. The weight of the device acting against the body causes withdrawal of the stabilizer from the open end of the container. Tension on the cable applied by the buoyancy of the float and the weight of the device forces a locking plug, connected to the line, up against the ends of the arms adjacent the line, forcing the arms to pivot 90 degrees away from the line perpendicular with respect to each other to extend the fabric and thereby deploy the stabilizer. (Author)

PATENT-4 335 520 Not available NTIS
Department of the Navy, Washington, DC.
Survey Spar System for Precision Offshore Seafloor Surveys.
Patent,
Jeffrey V. Wilson. Filed 22 Sep 80, patented 22 Jun 82, 8p AD-D009 661/0, PAT-APPL-6-189 245
Supersedes PAT-APPL-6-189 245, AD-D007 782.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A stiff, straight spar is allowed to pivot about an anchor on the seafloor. The location of the bottom with respect to the top is then determined by measuring the tilt of the spar and computing the offset of the bottom relative to the top. The straight member uses its internal buoyancy to remain erect and stable while the weight of the anchor keeps it in place on the seafloor. The top of the spar is tracked by shore stations while the tilt and heading of the spar is monitored by an instrumentation system. Simultaneous readings of the shore instruments and the spar's tilt and heading indicators allow direct determination of the anchor location relative to the shore. An air ballast control enables the apparatus to be easily maneuvered on the ocean bottom by divers or on the surface and an internal plumb bob system allows calibration of the overall system. (Author)

PATENT-4 335 670 Not available NTIS
Department of the Navy, Washington, DC.
Flexible Side Connector for Floating and Elevated Platforms.
Patent,
Clifford I. Skaalen, and Arthur B. Rausch. Filed 14 Jul 80, patented 22 Jun 82, 6p AD-D009 659/4, PAT-APPL-6-168 974
Supersedes PAT-APPL-6-168 974, AD-D007 448.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The patent describes a flexible side connector assembly comprising an in line flexural system having a plurality of rubber compression elements and a solid shear member. Both the adjacently aligned flexural member and the shear member have grooved solid heads at opposing ends of the assembly for insert of guillotines in opposing platforms which are to be coupled each to the other. (Author)

PB82-230814 PC **A04**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Swimming Vortex Cavities,
M. C. Meijer. Jun 81, 57p 521

A description is given of observations of ventilation phenomena in trailing vortices behind hydrofoils. A short qualitative analysis explains the observed existence of swimming ventilated cavities and indicates that these cavities must extend beyond the viscous core of the vortex. Lists of measured quantities are included for the benefit of students of the matter.

PB82-253667 PC **A07**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Resistance Tests of a Series of Planing Hull Forms with 25 Degrees Deadrise Angle,
J. A. Keuning, and J. Gerritsma. Mar 82, 127p 550

In 1963 E.P. Clement and D.L. Blount presented their paper on the resistance of a systematic series of Planing Hull Forms. During the last decade a growing interest has developed in using planing hulls in more exposed areas, for instance as pilot boats, coast guard vessels, workboats for offshore industry and small naval vessels. Therefore a systematic model experiment has been carried out with identical models to those used by Clement and Blount in their series, but with a deadrise angle of 25 degrees. These models have been tested with the same variation in design variables as in the original tests performed by Clement and Blount, i.e. the influence of the length-beam ratio, the weight of the vessel and the longitudinal position of the center of gravity has been examined, but the speed range has been reduced in the present tests.

PB82-259920 PC **A02**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
T.I.-59 Program for the Calculation of the Resistance of Sailing Yachts,
M. C. Meijer. Jun 81, 18p 522

In this report a calculator program is presented to compute the upright resistance of sailing yachts. The program is adapted to the programmable T.I.-59 calculator by Texas Instruments.

PB82-259938 PC **A04**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Added Resistance and Vertical Hydrodynamic Coefficients of Oscillating Cylinders at Speed,
W. Beukelman. Sep 80, 51p 510

With a rectangular and triangular cylinder forced oscillation tests in the vertical mode have been carried out for two speeds of advance. The added resistance due to oscillation has been measured while at the same time the hydrodynamic coefficients have been derived from the measured vertical forces. The results have been compared with computations for both resistance increase and the hydrodynamic coefficients.

PB82-259961 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Feasibility Study of Exploying the Rudder as an Antirolling Device,
K. Huang. Apr 81, 28p

Model tests and subsequent analysis of measurements in an attempt to employ the rudder as an antirolling device have been carried out in the Ship Hydromechanics Laboratory of the Delft University of Technology, the Netherlands. The experimental results showed that in addition to steering a rudder has considerable potential for roll stabilization at or near the resonant roll frequency, and the feasibility of combining steering and roll stabilizing by using only rudders exists undoubtedly. Up to now it seems that roll velocity feedback gain is the most effective among various types of feedback.

PB82-260522 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Geometry, Resistance and Stability of the Delft Systematic Yacht Hull Series,
J. Gerritsma, R. Omnink, and A. Versluis. 1981, 26p 520-P
Pub. in International Shipbuilding Progress, v28 n328 p276-297 Dec 81.

Resistance and stability in upright and heeled position has been determined for a series of twenty two systematically varied yacht hull forms. The analysed results of the model experiments are given in a form which can be used for various purposes in sailing yacht design, including velocity prediction.

PB82-260571 PC **A02**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Results of Recent Full Scale Seakeeping Trials,
J. Gerritsma. 1981, 14p 495

During the last fifteen years the Delft Shiphydromechanics Laboratory has carried out seakeeping tests with a number of different ships. These activities started after the International Towing Tank Conference in 1963 which recommended to carry out accurate full scale data under conditions suitable for analysis to be used for correlation with model tests.

PB82-261231 PC **A04**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Full Scale Trials with m.v. Hollandia. Part V: A Comparison of the 1978 Speed and Power Predictions with the Experimental Results,
J. M. J. Journee. Sep 80, 68p 508

The aim of the project is to investigate the feasibility of a computer based shipboard monitoring and prediction system to ensure safe and economic ship operation.

During two voyages in 1979 and 1980 the Delft Ship Hydromechanics Laboratory assisted to this project by measuring among others the sea and windconditions and the ship's speed, the r.p.m. of the propeller, the delivered engine power and the fuel consumption, to verify the delivered data-base. In this report a comparison is made between the 1978 predictions and the 1979 and the 1979 and 1980 experimental results.

PB82-261330 PC **A02**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Hydrodynamic Derivatives as a Function of Draught and Ship Speed,
J. Gerritsma. Jan 79, 20p 477

Forced oscillation experiments in sway and yaw have been carried out with a 10 feet model of the Series Sixty for five loading conditions and three forward speeds. The experiments included the bare hull condition, as well as the model equipped with rudder and propeller. In the last case rudder angle tests have been carried out, in addition to the determination of the yaw and sway derivatives. The various hydrodynamic derivatives are given in tabular form and the data include the corresponding straight line stability roots.

PB82-261355 PC **A02**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Bottom Impact Pressures Due to Forced Oscillation,
W. Beukelman. 1981, 22p 479-P

Forced oscillation tests about the water surface have been carried out with a segmented ship model to measure slamming pressures on two segments. A calculation procedure based on a two-dimensional approach has been proposed. These analytical results, together with those of other theories have been compared with the measurements.

PB82-261926 PC **A02**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. voor Scheepshydromechanica.
Safety of Beam Trawlers with a 'Fastening' Net,
J. A. Korteweg, and H. Vermeer. May 82, 16p 551-P

The main theme of the first part of this paper is to outline the mathematical evaluation of the motions of a beam trawler and the tensile force in the warp, upon the occasion one of the beamtrawls becomes suddenly fastened in an abrupt manner on an obstruction on the seabed e.g. a wreck during the operation of trawling. In the second part of this paper a review will be given of the tests with a model of a beam trawler, which have been carried out at the Ship Hydromechanics Laboratory of the Delft University of Technology, Netherlands.

PB82-263161 PC **A04**/MF **A01**
National Materials Advisory Board (NRC), Washington, DC.
Ferrous Metal Fires.
Final rept.
Jul 82, 75p NMAB-393
Contract DOT-CG-948071

Serious fires with bulk cargoes of ferrous metal turnings and with direct reduced iron (DRI) have occurred during marine transport. The U.S Coast Guard needs improved inspection and testing procedures for acceptance of these materials prior to shipment. This report presents background information on the types of ferrous materials of concern, their chemical and physical characteristics, present practices for handling and loading cargoes, and some case histories of fire incidents aboard ship. The panel then develops a conceptual model of spontaneous overheating to give some insight into the mechanisms of reoxidation and heat dissipation, the understanding of which is necessary to develop conclusions and recommendations for mitigating the problem of ferrous metal fires. Test methods for determining the susceptibility of cargo to overheating are discussed as well as countermeasures aimed at preventing or monitoring self-heating cargoes. Methods for intervening in the case of excessive heating of a cargo in a hold are also reviewed.

PB82-265281 PC **A09**/MF **A01**
Norske Veritas, Oslo.
S03 Project.
Final rept.,
Kare Lindemann, and S. Robertsson. Sep 81, 180p 81-0776, USCG-M-9-81
Contract DOT-CG-833401

The SO3-project has been working to improve ship handling procedures in waves. In particular research has been done to find a simple and reliable ship-borne hull motion and load monitoring and guidance system, (hull surveillance system). In this process, both technological feasible solutions and human reaction to those have been dealt with. It was among others concluded that a possible technological achievable level outreached the knowledge of the operator. The operator had to be brought up to a higher educational level in wave and wave-induced motions and loads in order to fully appreciate the developed system. In light of the above a simple hull motion monitoring unit is outlined and recommended put to use on ships to improve safety and operating economy.

PB82-875592 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Foundation Piles for Marine Platforms. 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for 1970-Sep 82.
Sep 82, 312p
Supersedes PB81-850232.

This bibliography contains citations concerning the design, installation, and certification of piles for marine foundations. Foundations include offshore platforms, piers, and approach and in-river bridge supports. The articles address natural forces on piles, including wave, tidal, ice, and seismic forces and the behavior of the piles in various bottom soils. Analytical and test reports cite bearing capacity and horizontal stiffness. Special subjects include underwater pile driving, and coatings for insertion friction and protection and endurance of the piling. (This updated bibliography contains 356 citations, 56 of which are new entries to the previous edition.)

PB82-876392 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Shipboard Fires. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 216p
Supersedes PB82-854852.

This bibliography contains citations concerning marine shipboard fires. Topics include sophisticated firefighting techniques; automated detection systems for heat, smoke, and combustion; automated extinguishing systems; and fire resistant materials for shipboard applications. Marine vessels in the commercial, industrial, naval, and private sectors are discussed. (This updated bibliography contains 166 citations, 72 of which are new entries to the previous edition.)

PB82-876400 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Shipboard Fires. June, 1970-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 57p
Supersedes PB80-853385.

This bibliography contains citations concerning marine shipboard fires. Topics include sophisticated firefighting techniques, automated detection systems for heat, smoke, and combustion, automated extinguishing systems, and fire resistant materials for shipboard applications. Marine vessels in the commercial, industrial, naval, and private sectors are discussed. (This updated bibliography contains 54 citations, 30 of which are new entries to the previous edition.)

PB82-916405 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Marine Accident Report - Collision of the U.S. Towboat M/V BRUCE BROWN and Tow with the the U.S. Towboat M/V FORT DEARBORN and Tow, Mile 677.6, Ohio River, December 9, 1981.
17 Jun 82, 27p NTSB-MAR-82-5

About 1200 c.s.t., on December 9, 1981, the U.S. towboat M/V BRUCE BROWN, while pushing a tow of four barges, and the U.S. towboat M/V FORT DEARBORN, while pushing a tow of two barges, collided in a blind bend about mile 677.6 in the Ohio River. As a result of the collision and ensuing fire, the FORT DEARBORN and its tow with damages estimated at $1.4 million were declared constructive total losses. The lead barge of the M/V BRUCE BROWN's tow suffered damages estimated at $300,000. No loss of life or personal injury resulted from this accident. The National Transportation Safety Board determines that the probable cause of this accident was the FORT DEARBORN's excessive speed in the bend, the failure of the BRUCE BROWN to hold up or stop below the bend, and the failure of both vessel operators to arrange a precise meeting agreement.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

PATENT-4 330 238 Not available NTIS
Department of the Navy, Washington, DC.
Automatic Actuator for Variable Speed Pump.
Patent,
Clark R. Hoffman. Filed 4 Mar 80, patented 18 May 82, 5p AD-D009 667/7, PAT-APPL-6-127 020
Supersedes PAT-APPL-6-127 020, AD-D007 076.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The patent describes an automatic speed-control actuator for variable speed pumps. A rotary or linear actuator changes the pump speed to prevent unacceptably low pressures on the pump inlet or unacceptably high pressures on the pump outlet; pressure switches at these locations control the actuator to produce maximum flow rates through the pump. (Author)

PB82-260191 PC **A04**/MF **A01**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
The Aid Hand-Operated Water Pump: A Classic Example of Technology Transfer,
Phillip W. Potts. Mar 81, 53p AID-PN-AAJ-561
Contract AID/ta-C-1354

A.I.D.'s technology transfer efforts have enabled various developing nations to produce their own hand-operated water pumps, thereby providing them with improved rural health, a source of pride and employment, and an alternative to costlier imported pumps. This report describes A.I.D.'s project to assess the applicability, initiate the manufacture and installation, and evaluate the performance of locally-produced water pumps in Nicaragua, Costa Rica, the Dominican Republic, Indonesia, Sri Lanka, Tunisia, and Ecuador. A.I.D. and the Georgia Institute of Technology (GIT), the project implementing agent, surveyed various nations' ability to manufacture the pump, their enthusiasm for the endeavor, the pumps' applicability to rural water supply programs (particularly those already involving A.I.D.), and local pump manufacturing costs versus import costs. An initial production run gauged local manufacturers' capabilities.

PB82-260274 PC **A09**/MF **A01**
Indian Pump Manufacturers Association, Bombay.
International Technical Seminar on Pumps for Thermal Power Stations Held at New Delhi, India on 13-14 March 1980. Volume I: Technical Papers.
Dec 80, 191p
See also Volume 2, PB82-260282.

This seminar was organized with the objective of focusing attention of pump manufacturers on the requirements arising out of the future power generation programs, and of the thermal power stations on the significance of pumps in the power generating system and the role they play in optimizing efficiency and reliability. Pumps in the sub-systems of a thermal power stations more or less work like the heart in the human body. This seminar deliberated on the various aspects of engineering, manufacturing, installation and operational behavior of the pumps. The specific application areas are: Feeding of water to the boiler drum, providing cooling water for condensers, condensate extraction, providing water for auxiliary systems like bearing cooling, fire fighting, in-feed to demineralizer, disposal

of wet ash, fuel oil feeding, transformer cooling water supply etc.

PB82-260282 PC **A05**/MF **A01**
Indian Pump Manufacturers Association, Bombay.
International Technical Seminar on Pumps for Thermal Power Stations Held at New Delhi, India on 13-14 March 1980. Volume II: Proceedings.
Dec 80, 86p
See also Volume 1, PB82-260274.

This Seminar was organized with the objective of focusing attention of pump manufacturers on the requirements arising out of the future power generation programs, and of the thermal power stations on the significance of pumps in the power generating system and the role they play in optimizing efficiency and reliability. Pumps in the sub-systems of a thermal power station more or less work like the heart in the human body. This seminar deliberated on the various aspects of engineering, manufacturing, installation and operational behavior of the pumps. The specific application areas are: Feeding of water to the boiler drum, providing cooling water for condensers, condensate extraction, providing water for auxiliary systems like bearing cooling, fire fighting, in-feed to demineralizer, disposal of wet ash, fuel oil feeding, transformer cooling water supply etc.

PB82-875493 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nondestructive Testing of Pipes and Tubes. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 143p
Supersedes PB81-851461.

This bibliography contains citations concerning the nondestructive techniques for testing or examining a wide variety of pipes and tubes for the detection of flaws or defects which affect their mechanical properties. (This updated bibliography contains 111 citations, 31 of which are new entries to the previous edition.)

PB82-875501 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nondestructive Testing of Pipes and Tubes. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 200p
Supersedes PB81-851479.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the nondestructive techniques for testing or examining a wide variety of pipes and tubes for the detection of flaws or defects which affect their mechanical properties. (This updated bibliography contains 198 citations, 49 of which are new entries to the previous edition.)

13L. Safety Engineering

AD-A118 456/3 PC **A15**/MF **A01**
Mission Research Corp., Santa Barbara, CA.
Mass Fire Model Concept.
Final rept. 8 Sep 80-31 May 81,
J. C. Sanderlin, J. A. Ball, and G. A. Johanson. 31 May 81, 330p MRC-R-636, DNA-5803F
Contract DNA001-80-C-0351

Review of the literature pertaining to mass fire onset and development indicates there exist no models that describe the onset and development of mass fires. The state-of-the-art is such that a low confidence level, parametric model can be developed. The theoretical basis, and a preliminary implementation, are described for a low confidence level, parametric model of mass fire onset and development in an urban environment. (Author)

AD-A118 595/8 PC **A07**/MF **A01**
Middlesex Research Center, Inc., Washington, DC.
Effects of Metric Change on Safety in the Workplace for Selected Occupations.
Final rept.,
Judith M. LeFande, and Joseph L. Pokorney. 21 Apr 82, 139p
Contract AA-80-SAC-X8605

The study assesses the potential safety issues of metric conversion in the workplace. A purposive sample of 35 occupations based on injury and illnesses indexes were assessed. After an analysis of workforce population, hazard analysis and measurement sensitivity of the occupations, jobs were analyzed to identify potential safety hazards by industrial hygienists, safety engineers and academia. The study's major findings were as follows: No metric hazard experience was identified. An increased exposure might occur when particular jobs and their job tasks are going the transition from customary measurement to metric measurement. Well planned metric change programs reduce hazard potential. Metric safety issues are unresolved in the aviation industry. (Author)

DE82012890 MF **A01**
Sandia National Labs., Livermore, CA.
Universal Signal Conditioner for Gas Alarm Systems.
R. E. Strout. Mar 82, 26p SAND-82-8003
Contract AC04-76DP00789
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A signal conditioner has been developed to interface an alarm system with a variety of detectors of flammable and nonflammable gases. A number of these units are being used in the Combustion Research Facility at Sandia National Laboratories, Livermore. (ERA citation 07:047941)

PB82-250879 PC **A18**/MF **A01**
National Center for Statistics and Analysis, Washington, DC.
Fatal Accident Reporting System (FARS) User's Guide.
Rept. for 1975-82,
Aug 81, 423p FHWA/DF-82/002A
For system on magnetic tape, see PB82-250887.

Fatal Accident Reporting System (FARS) User's Guide contains detailed information and instruction for use of the FARS data file which is a census of all fatal motor vehicle accidents in (1) the 50 States including the District of Columbia, and (2) Puerto Rico. Operational since 1975, FARS contains information on approximately 43,000 fatal accidents each year. The FARS User's Guide includes system overview, description of the data file, data element definitions, TPL explanation, and data entry forms. This guide is pertinent to all years.

PB82-250887 CP **T08**
National Center for Statistics and Analysis, Washington, DC.
FARS: Fatal Accident Reporting System.
Data file,
John MacGowan, and Barry Eisemann. 1981, mag tape FHWA/DF-82/002
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, PB82-250879.

FARS is a census of all fatal motor vehicle accidents in the 50 States, the District of Columbia, and Puerto Rico containing information obtained from state records and files. Operational since 1975, FARS contains information on approximately 43,000 fatal accidents each year. Two files for each year are available: (1) National data containing information from the 50 States and the District of Columbia; and (2) Puerto Rico data, a supplement to the national file.

PB82-254814 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
A Computer Program for Analysis of Smoke Control Systems.
Final rept.,
John H. Klote. Jun 82, 68p NBSIR-82-2512, NBS/DF-82/003A
For system on magnetic tape, see PB82-254822.

This paper describes a computer program developed to analyze systems intended to control smoke in building fires. These systems include pressurized stairwells, pressurized elevator shafts, zone smoke control systems, and pressurized corridors. This program calculates air flows and differential pressures throughout a building in which a smoke control system is operating. The basic assumptions and limitations of the program are also discussed. The appendices contain a program listing and examples.

PB82-255175 PC **A05**/MF **A01**
Dynamic Science, Inc., Phoenix, AZ.
Accident Investigation Studies in Conjunction with FMVSS 301 Compliance Testing (1981 Model Year).
Final rept.,
E. Enserink. Nov 81, 86p 3103-81-070/1894, DOT-HS-806 099
Contract DOT-HS-9-02274
See also PB80-134463.

The Accident Investigation Division (AID) of the National Center for Statistics and Analysis has been interested for several years in obtaining certain information on various impact modes and vehicle types through staged collisions. Collisions reported herein were performed under Contract titled 'FMVSS 301 Standards Enforcement Testing,' and were to establish data on frontal fixed barrier and rear-end moving barrier impacts. The information collected includes documentation of residual crush and acceleration data for each vehicle in each test.

PB82-258088 PC **A09**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Civilian Injuries by Cause.
1980, 187p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-258724 PC **A04**/MF **A01**
Case Western Reserve Univ., Cleveland, OH. Dept. of Mechanical and Aerospace Engineering.
Flame Spread and Spread Limits.
Final rept. 19 Jun 80-18 Jun 82,
Robert A. Borgeson. Jul 82, 59p NBS-GCR-82-396
Contract NB80-NADA-1017

The computer model of Frey and T'ien (1979) has been extended to study the effects of the initial bulk fuel temperature and an inert additive. The theory assumes a thermally thin solid in an opposed flow with negligible forward heat conduction in the fuel. Raising the initial fuel temperature was found to increase the flame spread rate by augmenting the fuel mass flux in the forward part of the pyrolysis zone. As the initial fuel temperature increases, the limiting value of the Damkohler number for extinction decreases. An inert additive reduces the spread rate by lowering the flame temperature and wasting energy in the inert pyrolysis.

PB82-259797 PC **A24**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Firefighter Casualties.
12 May 82, 558p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-260795 PC **A08**/MF **A01**
American Institutes for Research, Washington, DC.
Assessment of State and Local Capabilities to Respond to Federal Initiatives in Arson Prevention and Public Fire Education.
Final rept.
Aug 79, 154p AIR-79401-8/79
Grant USFA-79005

A literature search to identify programs and resources available to state and local organizations responsible for arson prevention and control was done; A series of technical conferences to review/critique a summary of arson prevention and control initiatives with representatives of the fire service, law enforcement officials, and private sector organizations (community organizations, insurance, banking, etc.) were conducted; and A set of individual, formal discussions about state

and/or local capabilities with officials of the 50 states who have responsibility for fire investigations was held.

PB82-262239 PC **A04**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
Crosstab of Fires: Occupancy by CIVDPF, FFIPF, EFD - 1980.
1980, 68p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-262924 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Vehicle Fires (30 States).
11 May 82, 27p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-262932 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1979 Vehicle Fires (17 States).
11 May 82, 30p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-262965 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1979 Outside Fires (17 States).
10 May 82, 28p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-262973 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Outside Fires (30 States).
10 May 82, 29p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-262999 PC **A05**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Residential Fire Losses: Area of Origin by Causegroup.
1980, 98p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-263237 PC **A10**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1978 Causegroups by Time and Month.
18 Nov 80, 204p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-263609 PC **A06**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1974-77 Death Rates by County.
4 May 81, 123p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-263708 PC **A09**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
Fire in the United States: Deaths, Injuries, Dollar Loss, and Incidents at the National, State, and Local Levels in 1978 (Second Edition).
Jul 82, 188p FEMA-22

The report is the second edition of Fire in the United States, an analysis of the Nation's fire problem. FEMA's responsibility includes providing assistance to fire departments and state fire service organizations in identifying the major causes of fire losses for better fire protection planning and management, determining the magnitude of the national problem and monitoring the progress of programs to reduce fire loss. Each edition of Fire in the United States offers an analysis of national fire data and discusses its implications for fire prevention and control.

PB82-263765 PC **A05**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Study of Car/Truck Crashes in the United States.
Final rept.1 Mar 81-1 Jun 82,
Arthur C. Wolfe, and Oliver M. Carsten. May 82, 84p UM-HSRI-82-2
Sponsored in part by AAA Foundation for Traffic Safety, Falls Church, VA.

This report provides descriptive information about truck-car accidents in the United States using primarily data from the Fatal Accident Reporting System (FARS). In 1980 14 percent of all fatal accidents (37 percent) of fatal multi-vehicle accidents) involved at least one car and one truck. Over half of these involved pickups and vans, while about one-seventh involved combination vehicles. Trucks, especially combination vehicles, are overinvolved in fatal accidents relative to FHWA estimates of miles traveled by different vehicle types. Truck-car involvement rates increased substantially from 1977 to 1979 but declined in 1980 (mainly for combination vehicles). Other descriptive data are presented on fatality ratios in truck-car fatal crashes by type of truck and weight of car; on type of road; on road alignment; on road wetness; on light condition; on age of driver; on seat belt use; on vehicle rollover; on vehicle fire; on causative factors; on manner of collision; and on time of day and time of week.

PB82-263799 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 National Estimates Reports (1-4): Alaska.
1980, 34p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-264029 Not available NTIS
National Bureau of Standards, Washington, DC.
International Standardization of Fire Tests of Building Materials and Structures: A Progress Report.
Final rept.,
D. Gross. Mar 79, 4p
Pub. in Fire Jnl. 73, n2 p79-82, 90 Mar 82.

A brief history is provided of the formation and growth of ISO Technical Committee 92 on Fire Tests of Building Materials and Constructions. Present and future standards and Working Group activities are described. Comparisons are made between national, international and regional standardization activities dealing with fire tests.

PB82-265117 PC **A06**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1974-78 Death Rates by County.
30 Apr 81, 125p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265182 PC **A11**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Outside Fires.
1981, 232p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265208 PC **A04**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 All Fires: FMI by TMI.
1981, 72p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265216 PC **A03**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Crosstab of Firefighter Injuries and Deaths.
1981, 27p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265224 PC **A06**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1979 Ranking of Fire Departments.
21 Oct 80, 111p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265430 PC **A06**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Civilian Deaths: Causegroup by Injury Related Variables.
1980, 108p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265455 PC **A19**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Occupancy by Area of Origin by Causegroup: All Fire Losses.
1980, 450p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265463 PC **A20**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Crosstab of Residential Fires: Cause by CIDEA by Occup.
1980, 452p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265562 PC **A04**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
Occupancy by Firefighter Injury Class by Death Class-1980.
1980, 66p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-916204 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.

Highway Accident Report - Truck Engine Fuel Tank Puncture by Bridge Repair Plate, Diesel Spill, and Multiple Vehicle Skidding Collisions, Interstate Route 10, Lake Charles, Louisiana, August 27, 1981.
15 Jul 82, 43p NTSB-HAR-82-4
Paper copy also available on subscription, North American Continent price $50.00/year; all others write for quote.

About 10:25 p.m. on August 27, 1981, a tractor-semitrailer loaded with steel pipe was traveling eastbound across the Calcasieu River Bridge, a 1 1/4-mile long, four-lane divided highway bridge on Interstate 10 at the city limits of Lake Charles, Louisiana. As the truck was descending the east side of the bridge, the tractor's left side fuel tank was struck and penetrated by a dislodged bridge repair plate that had been used to cover a hole in a pavement expansion joint. As a result of about 75 gallons of diesel fuel leaking onto a 1/2-mile section of the bridge, 26 vehicles were involved in a series of skidding collisions. Three persons were killed, and 18 persons were injured; there were no fires. The National Transportation Safety Board determines that the probable cause of this accident was the loss of vehicle control on a slippery highway surface, produced by a diesel fuel spill from a truck fuel tank punctured by a dislodged steel plate used as a temporary repair of a bridge expansion joint. Contributing to the accident was the failure of the Louisiana Department of Transportation and Development to make a permanent repair at that joint.

PB82-916911 PC **A07**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad Accident Reports - Brief Format, Issue Number 3 - 1980.
14 Jul 82, 144p NTSB-RAB-82-2
Paper copy also available on subscription, North American Continent price $130.00/year; all others write for quote.

This publication contains briefs of selected railroad accidents occurring in U.S. Railroad operations during calendar year 1980. The brief format presents basic facts, conditions, circumstances, and probable cause(s) in each instance. Additional statistical information is tabulated by types of accidents and casualties related to types of accidents, carriers involved, and causal factors.

PB82-917001 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad/Highway Accident Report - Miller Transporters, Inc., Tractor Cargo Tank-Semitrailer/ Southern Railway System Freight Train Collision and Fire, Huntsville, Alabama, September 15, 1981.
9 Mar 82, 46p NTSB-TSR-RHR-82-1
Paper copy also available on subscription, North American Continent price $90.00/year; all others write for quote.

At 9:00 a.m. c.d.t., on September 15, 1981, a northbound truck tractor-cargo tank semitrailer loaded with 8,986 gallons of gasoline was struck by a westbound freight train at a railroad/highway grade crossing on Jordan Lane in Huntsville, Alabama. The gasoline cargo escaping from the ruptured cargo tank splashed over the locomotive and four passenger cars, that had stopped north of the track to await the train's passage, and ignited. At the time, the crossing warning red lights were flashing and the bell was ringing; the train lights were illuminated, its bell was ringing, and its whistle was sounding. Five persons were killed, two persons died later as a result of their injuries, and four of five train crewmembers were injured. The National Transportation Safety Board determines that the probable cause of this accident was the failure of the truckdriver to comply with the activated crossing warning signal and Federal regulations and company rules that require hazardous materials carriers to stop at all nonexempt railroad crossings to determine if it is safe before crossing the tracks.

PB82-917003 PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Special Investigation Report - Derailments of New York City Transit Authority Trains Involving Traction Motor Mount Failures.
15 Jul 82, 43p NTSB-TSR-SIR-82-2
Paper copy also available on subscription, North American Continent price $90.00/year; all others write for quote.

At 5:50 a.m., on December 15, 1981, a nine-car New York City Transit Authority (NYCTA) southbound No. 3 subway train, designated 527A 148/FA, departed on track No. 2 after making a station stop at Times Square Station in New York City, New York. Moments later, while the train was accelerating, a traction motor fell from under the third car. The third car derailed and caused the fourth car to derail also. Twelve passengers were injured and damage was estimated to be $287,000. Three other derailments involving a traction motor falling from an NYCTA car to the tracks occurred between January 12, 1981, and March 7, 1982. The derailment of December 15, 1981, in which 12 passengers were injured, was the most severe of the four derailments; however, because of the Safety Board's concern that four similar derailments should occur within 15 months, and its continued concern about inspection and maintenance practices of the NYCTA, all four derailments were investigated and are discussed in this report. The National Transportation Safety Board determines that the probable cause of each of the four derailments was the failure of the inspection procedures of the New York City Transit Authority to detect that the traction motor mounts had failed and that the motors were riding on axles before they dropped to the tracks.

13M. Structural Engineering

DE82013420 MF **A01**
MASEC Corp., Minneapolis, MN.
Home Retrofitting for Energy Conservation and Solar Considerations.
Oct 81, 98p MASEC-SCR-81-091
Contract AC02-79CS30150
Best available copy from document source. Available in microfiche only.

This manual explains both the key concepts behind our need for and our impact on energy usage, as well as a nuts-and-bolts explanation of how to improve the energy efficiency of your home. By reviewing both the concepts and practices of energy conservation, the manual presents a comprehensive picture of how home energy use is effected by the inhabitants and by the structure itself. The manual begins with an explanation of why we are looking at energy, then proceeds to explain how the heat transfer occurs between houses and humans. Next is a chapter on energy audits and how to use them, followed by a comprehensive section on energy conservation actions to do now to reduce energy use. Conservation actions include low cost/no cost measures, schemes to reduce infiltration, how to increase insulation, and what to do with windows and doors, heating and heat distribution systems, and water heaters. Solar energy options are then briefly explained, as well as the all important issues of financing and tax credits. The manual concludes with a bibliography to direct the reader to more sources of information. (ERA citation 07:043988)

DE82013460 PC **A02**/MF **A01**
Union Carbide Corp., Oak Ridge, TN. Nuclear Div.
Hotel-Motel Fires: Past and Present.
J. T. Blackmon, Jr. 23 Apr 82, 17p CONF-820443-1
Contract W-7405-ENG-26
American School and Community Safety Association meeting, Houston, TX, USA, 23 Apr 1982.

The Winecoff Hotel Fire in 1946 triggered a great deal of activities directed toward improving methods of survival should a guest be involved in fire. In the 36 years since that event a great deal has transpired. Building integrity, construction, maintenance, firefighting appliances, occupant self protection systems, emergency communications and controls have drastically improved. However, fires continue to plague the unwary traveler thus this commentary reviews how a guest can probably survive with advanced planning on his or her part. While self preservation is the first priority, one should be actively engaged in learning what is going on in the community so that they can assist the community in providing fire safe structures at their places of business and at the other facilities where guests to their communities can conduct business and relax. (ERA citation 07:044846)

DE82014067 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Application of DOE-2 in the Predesign Phase of Commercial-Building Design.
J. L. Peterson, and B. D. Hunn. 1982, 7p LA-UR-82-989, CONF-820629-8
Contract W-7405-ENG-36
American section of the International Solar Energy Society conference, Houston, TX, USA, 1 Jun 1982, Portions of document are illegible.

This paper presents the results of a study in applying a high-level, computer-dynamic tool, DOE-2, to the predesign process for a standard test office building. This study was part of a larger study wherein five analysis tools, ranging from manual to computer-dynamic methods, were used to provide predesign energy information. The purpose was to test whether computer-dynamic tools, such as DOE-2 and BLAST, can readily provide the necessary predesign information in a usable visual format and without excessive cost. (ERA citation 07:042981)

DE82701507 PC **A02**/MF **A01**
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
Upper Bound Limit Analysis of Spherical Pressure Vessels with Protruding Nozzles and Associated Defects at the Intersection.
A. G. Miller. Aug 81, 22p CEGB-RD-B-5117N81
U.S. Sales Only.

The limit analysis of a circumferential partial penetration defect around the intersection of a sphere and a cylinder has been investigated. An upper bound to the limit pressure has been determined by considering four independent mechanisms, and compared to an existing lower bound solution. (Atomindex citation 13:661946)

DE82701508 PC **A03**/MF **A01**
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
Strip Yielding Model for Calculation of COD in Spheres with Short Cracks.
A. G. Miller. Aug 81, 28p CEGB-RD-B-5123N81
U.S. Sales Only.

The crack opening displacement at the centre of a crack in a sphere with internal pressure has been calculated, using a strip yielding model. The results have been displayed for a range of geometrical parameters and loads. (Atomindex citation 13:661947)

DE82902980 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Bologna (Italy). Dipartimento Reattori Veloci.
Benchmark Calculations on Simple Structures Involving Plasticity, Creep, and Temperature Dependence.
F. Cesari, and R. Orsi. Apr 81, 85p CNEN-RT/ING-81-9
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The present paper refers to the computer code ADINA response to the simple benchmark calculations. The main features of the problems considered are respectively an isothermal plasticity problem with monotonic pressure loading, steady-state creep with purely elastic instantaneous material response and a combined creep-elastic problem under purely mechanical loading conditions. (ERA citation 07:044333)

PB82-260811 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Nontechnical Summary of the Final Report 'Optimal Weatherization of Low-Income Housing in the United States: A Research Demonstration Project'.
Final rept. Sep 77-Sep 81,
Stephen T. Margulis, and Roy E. Clark. Aug 82, 45p NBSIR-82-2539
Contract CSA-A8B-0018

This report summarizes in nontechnical language the nature and results of the Community Service Administration's (CSA's) Optimal Weatherization Demonstration Research Project carried out by the National Bureau of Standards (NBS). This summary draws on the final report of the field evaluation of the Demonstration, an NBS publication entitled Optimal Weatherization of Low-Income Housing in the U.S.: A Research Demonstration Project (NBS BSS 144). Unless stated otherwise, this report references the final report. The

CSA/NBS demonstration installed both architectural (Building shell) and mechanical systems weatherization options, and achieved, when both types of options were used, an average reduction in space heating fuel consumption of 41 percent, at an average weatherization cost of $1,862 per house.

PB82-260852 PC **A02**/MF **A01**
Structural Engineering Research Centre, Madras (India).
Shell Structures - Two Research Papers,
Zacharia George,. 1982, 20p

This document contains two papers: 'Construction Sequence: Its Influence on Design of Shells and Folded Plates'; and 'Prefabrication as Applied to Shells'. A project involving the use of shell structures demands that the construction method is considered along with the analysis and design. In case of shells, it is often the factor which decides the design. This is because, from the design point of view, the major portion of the design load is in the form of self weight, very often exceeding 75% of the total design load. The construction method and equipment available also decides the layout of the shells. If cost is the primary consideration, it is the construction method which controls the cost factor of the shell structures. The most difficult component of construction of shells is the form work, both from the point of view of cost and intricacy. To overcome the difficulties presented by the formwork and centering, prefabrication is resorted to for building of shells.

PB82-260993 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
An Analysis of Sections 4.2 through 4.14 of the GSA Proposed Uniform Federal Accessibility Standard,
George Turner. Aug 82, 60p NBSIR-82-2567
Sponsored in part by General Services Administration, Washington, DC.

Recently, the General Services Administration (GSA) developed a draft uniform accessibility standard (the focus of this report) intended to be promulgated in conjunction with the Department of Housing and Urban Development, the Department of Defense, and the United States Postal Service. Under contract to the General Services Administration, the National Bureau of Standards (NBS), Center for Building Technology assisted in the review of part 4, sections 4.2 through and including 4.14 of the draft standard in order to determine the extent to which previously identified problems of accessibility (NBS database) were addressed by the provisions of the standard. The analysis was carried out by reviewing and classifying the provisions of the draft standard; searching the NBS data base for information relevant to the classes of provisions in the draft standard; and comparing the provisions with the NBS database.

PB82-261587 Not available NTIS
National Bureau of Standards, Washington, DC.
An International Performance-Based Standard Method of Developing National Product Specification Standards.
Final rept.,
Charles T. Mahaffey. 1980, 6p
Pub. in Proceedings of Int. Standardization--Testing, Certification and Related Matters, and Their Implication Under Trade Agreements Act of 1979, Washington, DC, October 15-16, 1980, p1-6.

This paper describes and proposes international consideration of a method that coordinates the international and national application of the ISO concept of 3 levels of standards. These 3 levels, intended to establish a technically-based hierarchy among standards, are defined by ISO as follows: Level 1--Fundamental standards--General principles and fundamental standards for buildings and civil engineering structures; Level 2--Wide Ranging Standards--Standards for groups of products concerning preferred dimensions, performance requirements, general test methods, etc.; and Level 3--Specific Standards--Descriptive standards for specific building products, materials or components concerning properties, test methods, etc. This proposed method pertains directly to the development and use of wide ranging ISO level 2 performance standards and related test methods--for products grouped according to their intended end-uses--in the subsequent development of national, level 3 specification standard, for each alternative nationally-manufactured product within such end-use groupings.

PB82-262122 PC **A06**/MF **A01**
Swedish Council for Building Research, Stockholm.
Steel Structures Subjected to Dynamic Loads in Connection with Progressive Collapse. Dynamic Buckling,
Per Christiansson. 1981, 120p ISBN-91-540-3681-X, D7:1982

When a building is subjected to local damage there is a risk that the damage will develop into a progressive collapse. One way of reducing this risk is to provide for an alternative load-carrying system. It is however possible that the structure will not sustain the dynamic effects during the transition stage before the alternative bearing system is developed. This report contains a study of the dynamic transition stage, with special reference to dynamic column buckling.

PB82-262163 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Dept. of Aerospace Engineering.
Buckling of Shells with General Random Imperfections,
Isaac Elishakoff, and Johann Arbocz. Aug 80, 31p MEMO/M-401

The paper is concerned with the effect of random axisymmetric and asymmetric imperfections on the buckling of circular cylindrical shells under axial compression. The initial imperfections are considered as random functions of the axial and the circumferential coordinates. This is done by expanding them in terms of the buckling modes of the associated perfect structures, and then treating the Fourier coefficients as random variables. In contrast to earlier works the probabilistic properties (the mean function and the autocorrelation function) are not assumed but the mean vector and the variance-covariance matrix of the Fourier coefficients are calculated from experimental measurements of the shell profiles. The Fourier coefficients needed for the application of the Monte Carlo Method are simulated by a special numerical procedure. Thus a large number of shells is 'created'. For each shell a deterministic analysis of buckling stress evaluation is carried out. Finally, the reliability function representing the probability (i.e. fraction of an ensemble) of the buckling stress exceeding the specified stress is calculated.

PB82-262270 PC **A02**/MF **A01**
Central Building Research inst., Roorkee (India).
Building Digests: Building Protection,
B. C. Srivastava, J. S. Sharma, M. Aslam, Shiva Mohan Singh, and M. P. Jaisingh. 1977, 25p

This document is a compilation of 5 bulletins. These are: water-proofing of prefabricated roofing schemes; damp proofing of existing buildings by latex-siliconate; dampness in buildings; insertion of damp-proof course in existing walls; and protection of buildings against vegetative growth. These bulletins provide comprehensive, step-by-step instructions for carrying out the techniques described.

PB82-262288 PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Manpower and Material Requirements for Buildings,
S. Singh, G. C. Sofat, A. K. Jethi, and S. K. Jain. 1981, 33p

This document is a compilation of 4 bulletins. An attempt has been made to obtain the required information with the help of simple equations which make it very speedy. The quantities of materials and labor required for a building are directly computed for a given plinth area with the help of certain empirical equations. The analysis has been made for the building portion of single, double and four-storyed residential buildings, building services and office buildings.

PB82-262296 PC **A05**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Heating and Thermal Aspects of Building,
Prakash Chandra, K. N. Agarwal, S. P. Jain, M. R. Sharma, and Sharafat Ali. 1981, 94p

This document is a compilation of 14 bulletins. These are: Thermal Performance of Building Sections in Different Thermal Climatic Zones of the Country; Thermal Response of 4.5 inch Solid Brick Wall Room in Hot-Dry Climates; Evaluation of Thermal Stress-Tropical Summer Index; Correction Factors for Thermal Performance Index; Thermal Performance Rating and Classification of Walls in Hot Climate; Thermal Performance Rating and Classification of Flat Roofs in Hot Dry Climates; Thermal Insulation at Low Temperature; Thermal Data of Building Fabrics and its Application in Building Design; Assessment of Solar Radiation on Buildings; Determination of Tropical Summer Index in Office Buildings; Determination of Sunlight Penetration Indoors; Orientation of Buildings; The Climatic and Environmental Zones for India - Simplified Advice for Building Design; and Thermal Considerations in Building Design - Insulated Masonry Structures. These bulletins provide comprehensive, step-by-step instructions on how to make full use of the techniques described. Many graphs and charts are provided.

PB82-262304 PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Concrete, Cement, and Bricks,
P. L. De, B. D. Mittal, C. A. Taneja, Shiva Mohan Singh, and S. S. Rehsi. 1976,42p

This document is a compilation of 9 bulletins. These are: Concrete Building Blocks and Block Masonry; Accelerated Testing of 28-Day Strength of Concrete; Sea Water for Making Concrete; Foamed Concrete Blocks; Removal of Stains from Concrete Floors; Deterioration of Concrete in Sulphate and Soft Waters; Autoclaved Aerated Concrete; and Economy in the Use of Cement. These bulletins give comprehensive, step-by-step instructions on how to make use of the materials and procedures covered. Three additional bulletins have been added to this booklet. They are: Lime Bursting in Bricks; Flyash Mortar for Brick Masonry; and Brick Earths of India.

PB82-262312 PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Acoustic Aspects,
P. S. Bhandari, L. B. Yadava, S. K. Asthana, C. G. Balachandran, and R. K. Srivastava. 1977, 26p

This document is a compilation of 5 bulletins. These are: Acoustical Designing and Speech Communication; Acoustical Properties of Sound Absorbing Materials and Room Design; Noise and Its Control; and Acoustical Design of Partitions for Open Plan Spaces. These bulletins provide comprehensive, step-by-step instructions on how to use the techniques and materials described.

PB82-262445 PC **A06**/MF **A01**
National Research Council, Washington, DC. Building Research Advisory Board.
Transactions of the Federal Construction Council for 1979-80.
Final rept.
Jul 81, 116p
Contract NB80-NAHA-1010
See also PB80-213283. Sponsored in part by Department of the Air Force, Washington, DC., Department of the Army, Washington, DC.,Department of the Navy, Washington, DC., Department of State, Washington, DC.

The report includes the following eleven papers prepared by the committees indicated: Standardizing The Structural Engineering Criteria of Federal Construction Agencies (Standing Committee on Civil and Structural Engineering); Update of Criteria for Stationary Diesel Engines (Standing Committee on Electrical Engineering); Low-Slope Roofing Problems (Standing Committee on Materials Engineering); The Experience of Federal Agencies with Variable Air Volume HVAC Systems (Standing Committee on Mechanical Engineering); Developing Systems-Oriented Operations and Maintenance Manuals (Standing Committee on Operations and Maintenance); Guidelines for the Use of Architect-Engineer Contracts for Miscellaneous Projects (Standing Committee on Procurement Policy); Conference on Good Architectural Design (Standing Committee on Architecture and Architectural Engineering); Seminar on Management of Computer Activities in Federal Construction Agencies (Standing Committee on Computer Technology); Workshop on Market Analysis (Standing Committee on Cost Engineering); Providing for Safety in Federal Facilities (Standing Committee on Facilities' Safety); Meeting on Proposed Revisions to

Firesafety Standards (Standing Committee on Fire Protection).

PB82-262957 PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
For Building and Construction.
Technical notes,
G. D. Bansal, Devendra Sharma, Chandra Prakash, K. R. Rao, and S. P. Jain. 1981, 58p

This document is a compilation of 16 Technical Notes. These are: Apertures other than Northlights; Design of pile caps; thermal insulation of roofs of industrial buildings; room heating by solar energy; charging device for small capacity lime kilns; waste water disposal system for rural areas; low cost sound absorbing materials; solar space heating system; pedestal piles for low cost houses; solar timber seasoning kiln; design of cold storage for fruits and vegetables; techniques for improved thatch roofs; resilient floors for structural noise reduction; plastic composite panels for partition claddings and flush doors; chimney design for domestic kitchens; and a cheap and effective fire retardant treatment for paddy thatch/coconut leaves/palmyrah thatch. The notes give brief descriptions of the design and use of the materials and techniques covered.

PB82-263013 PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Technique Series: Data Sheets,
M. P. Jaisingh, Lathika Jaisingh, S. K. Jain, N. N. Bhise, and K. N. Sharma,. 1978, 66p

This document is a compilation of 6 Data Sheets. They are: Thin Precast RCC Lintels in Brickwalls; Cored Unit for Roof/Floor; Channel Unit for Floor/Roof; Waffle Unit for Roof/Floor; Precast Shelving Units for Dwellings; and L-Pan Roofing. The Data Sheets contain descriptions of the materials, their advantages and disadvantages, and charts and diagrams for their use.

PB82-263278 PC **A05**/MF **A01**
National Research Council, Washington, DC.
Transactions of the Federal Construction Council for 1980-81.
Final rept.
Jul 82, 94p
Contract NB80-NAHA-1010
See also PB80-213283. Sponsored in part by Department of the Army, Washington, DC., Department of the Air Force, Washington, DC., Department of the Navy, Washington, DC., and Department of State, Washington, DC.

The report includes the following eight papers by the standing committees indicated: Review of Three Recommendations on Architect-Engineer Procurement of the Commission on Government Procurement (Standing Committee on Procurement Policy); Preliminary Planning for Construction Projects (Standing Committee on Contract Management); Barometric Technique for Evaluating Construction Market Conditions (Standing Committee on Cost Engineering); Quality Assurance of Civil and Structural Engineering Work Performed under Contract (Standing Committee on Civil and Structural Engineering); System for Rating Building Designs (Standing Committee on Architecture and Architectural Engineering); Summary of a Workshop on Low-Slope Roofing (Standing Committee on Materials Engineering); Specifying and Coordinating the Instruction of Operations and Maintenance Personnel Assigned to New Federal Facilities (Standing Committee on Operations and Maintenance); Computer Training for Federal Construction Agency Personnel (Standing Committee on Computer Technology).

PB82-263336 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Health and Safety Considerations for Passive Solar Heated and Cooled Buildings.
Final rept.,
F. Eugene Metz, James H. Pielert, and Patrick W. Cooke. Aug 82, 67p NBSIR-82-2554
Contract DE-AI01-76PR06010

Passive solar buildings often introduce alternative construction techniques, and new materials and applications which presently have limited guidelines concerning safe application. This report discusses research conducted to pursue the nature of health and safety considerations in application of solar passive technology to buildings and how they would be affected by current building regulatory requirements. Health and safety considerations associated with solar passive systems are discussed including: indoor air quality; structural safety; fire safety; and environmental issues such as ventilation, illumination, temperature control, humidity and noise control. The report also identifies technical issues and research needs for addressing health and safety issues in passive solar technology.

PB82-263369 PC **A04**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
Evaluating Alternative Strategies for Reducing Residential Fire Loss: The Fire Loss Model.
Interim rept.,
Alan Gomberg, Benjamin Buchbinder, and Fred L. Offensend. Aug 82, 68p NBSIR-82-2551
Prepared in cooperation with SRI International, Menlo Park, CA.

This report provides a preliminary documentation of a decision analysis framework for evaluating alternative residential fire loss reduction strategies. The framework, when it is completed, will provide a systematic means for assessing the costs and losses occurring under different intervention strategies. The current report focuses entirely on the problem of assessing fire losses, as this is where most of the uncertainty on system performance occurs. Subsequent reports will address the cost of the alternatives, after which the alternatives can be compared on a comprehensive cost/benefit basis.

PB82-263401 PC **A03**/MF **A01**
Factory Mutual Research Corp., Norwood, MA.
Pipe and Fittings for Residential Automatic Sprinkler Systems Product Performance Standard.
Final rept.
Jun 82, 33p

This proposed standard is intended to set performance requirements for pipe and fittings, and joints between them, to be used in residential automatic sprinkler systems installed in accordance with the standard for the installation of Sprinkler Systems-One- and Two-Family Dwellings, ANSI/NFPA No. 13D-1980. It was written specifically to provide criteria against which to evaluate plastic piping materials; however, it may be used to evaluate any pipe and fittings not already specifically allowed in NFPA 13D-1980, since it is based upon the physical requirements of that service and not on the characteristics of any particular material.

PB82-263955 Not available NTIS
National Bureau of Standards, Washington, DC.
Re-examination of the Relation between Splitting Tensile and Compressive Strength of Normal Weight Concrete.
Final rept.,
N. J. Carino, and H. S. Lew. 1982, 6p
Pub. in ACI Jnl. of Technical Paper, Title No. 79-23, p214-219, May-Jun 82.

Based on statistical analyses of selected data, which included concretes with compressive strengths from 980 psi (6.9 MPa) to 5750 psi compressive strength function is not the most appropriate relation for selected data or data with a similar precision and the same range; rather, a simple power function is more applicable over a wide range of concrete strengths.

PB82-264201 Not available NTIS
National Bureau of Standards, Washington, DC.
Measuring the Leakage of Door Assemblies during Standard Fire Exposures.
Final rept.,
Leonard Y. Cooper. 1981, 12p
Pub. in Fire and Materials 5, n4 p163-174 1981.

A basis for relating overall intrabuilding smoke migration dynamics to high temperature, door assembly smoke leakage measurements is formulated. The results of applying the tentative, high temperature, International Organization for Standardization (ISO) test method DP 5925 Part 3, which was developed to measure smoke leakage of door assemblies during the course of a standard fire endurance test, are reported. A critical analysis reveals that the basic objective of the test method is limited in its utility in that fire scenarios in high-rise buildings may not be adequately simulated. Independent of this limitation the analysis then identifies certain theoretical problems with the test method and its procedures. These lead to a conclusion that the test method is not generally reliable. An alternate test concept which removes the above-mentioned limitation and all of its problems is described, and its development is advocated.

PB82-264235 Not available NTIS
National Bureau of Standards, Washington, DC.
Air Flow and Multi-Room Thermal Analysis.
Final rept.,
George N. Walton. 1982, 11p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in American Society of Heating, Refrigerating and Air-Conditioning Engineers Transactions 88, Technical paper no. 2704, pt. 2, 11p 1982.

A model for computing the infiltration and air flow between rooms of a multi-room building is presented in terms of basic principles of fluid mechanics. This model has been incorporated into a comprehensive loads-predicting computer program. Air flows, room temperatures, and heating loads for a typical townhouse under different conditions of environment and with various construction features are computed. These calculations show the feasibility of detailed multi-room air movement analysis. They also indicate that when the inter-room openings of a low-rise structure are large compared to the envelope openings, the infiltration and total load can be accurately, and more quickly, computed by assuming no resistance to air flow between rooms. This property will also allow simplified calculations for high-rise buildings with many rooms. Methods are proposed for handling more complex air flow phenomena.

PB82-264433 Not available NTIS
National Bureau of Standards, Washington, DC.
In Case of Fire - Use the Stairwells, Elevators Aren't Safe.
Final rept.,
W. Schmidt, and John H. Klote. May 82, 5p
Sponsored in part by Veterans Administration, Washington, DC.
Pub. in Specifying Engineering 47, n5 p82-86 May 82.

This paper is the initial report of an ongoing project at NBS to investigate the use of elevators as a means of fire escape for the handicapped. The use of stairwells for fire evacuation poses a problem for people who cannot use stairs because of physical disabilities. This paper discusses some of the major problems associated with the use of elevators as a means of fire exit and proposes a conceptual solution to those problems. A report is made on field tests of four buildings with elevator protection systems. These protection systems and their interaction with other systems is examined.

PB82-265042 PC **A06**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Residential Fire Losses.
1980, 106p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265083 PC **A08**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Heating Fire Losses by FMI.
1980, 163p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265091 PC **A06**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1979 Residential Fires: Cause by Month.
23 Aug 80, 106p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265190 PC **A09**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1980 Residential Fire Losses.
1981, 187p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265273 PC **A11**/MF **A01**
Federal Emergency Management Agency, Washington, DC.
1979 Residential Fires: Causegroups by Time and Month.
19 Nov 80, 238p

This document contains computer tables generated from data collected by the NFIRS for use as supportive data only and requires understanding and familiarity of the data system.

PB82-265380 PC **A04**/MF **A01**
TPI, Inc., Beltsville, MD.
National Bureau of Standards Passive Solar Test Building Handbook.
Final rept.,
Keith W. Lindler. Aug 82, 56p TPI/SR-82-05, NBS-GCR-82-398
Sponsored in part by Department of Energy, Washington, DC.

The National Bureau of Standards Passive Solar Test Building was constructed for the class A Passive Solar Program of the U.S. Department of Energy. The Test Building is located in Gaithersburg, Maryland (39.0 deg n latitude, 77.3 deg W longitude) at an elevation of 417 ft. The handbook provides a complete physical description of the building including floor plans and dimensions, structure, wall cross-sections, and material properties. The location of various sensors installed in and around the building is also provided.

PB82-265703 Not available NTIS
National Bureau of Standards, Washington, DC.
Thermal Convection and Design Wind Speeds.
Final rept.,
Emil Simiu. Jul 82, 7p
Pub. in American Society of Civil Engineering 108, nST7 p1671-1675 Jul 82.

Estimates are presented of the extent to which the effect of thermal convection upon wind profiles is significant in structural engineering and extreme climatological calculations. The estimates are based upon Monin and Obukhov's theory and recent experimental results reported in the meteorological literature.

PB82-266263 PC **A04**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Lighting, Ventilation, and Air Movement in Buildings.
N. I. V. Krishak, P. K. Bhargava, Z. U. A. Warsi, V. K. Maitreya, and Ishwar Chand. 1979, 75p

The bulletins discuss the optimization of building orientation and window installation for maximum daylight lighting.

PB82-266271 PC **A03**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Cooling of Buildings.
V. V. Verma, K. N. Agarwal, Prakash Chadra, S. P. Jain, and M. R. Sharma. 1981, 47p

This document is a compilation of 9 bulletins. These are: Control of Solar Heat Gain through Glass Windows; Simple and Effective Roof Spraying System of Cooling Buildings in Hot Dry Climates; Shading Devices for Glass Openings in Air-conditioned Buildings; Cooling of Buildings by Roof Surface Evaporation; Roof-surface Evaporative Cooling of Buildings by Water Soaked Gunny Bags; Loose Fill Materials for Cold Storage Insulation; Cooling Load and Indoor Air Temperature of Office Buildings under Tropical Climate; Thermal Design of Potato Cold Storage; and Suitability of Rice-husk and Saw-dust as a Cold Storage Insulation. These bulletins provide comprehensive, step-by-step instructions on how to use the materials and techniques covered.

PB82-266289 PC **A02**/MF **A01**
Central Building Research Inst., Roorkee (India).
Building Digests: Painting and Finishing.
Shiva Mohan Singh, Joseph George, and Mohan Rai. 1970, 21p

This document is a compilation of 5 bulletins. These are: Painting Woodwork; Painting Non-Ferrous Metals in Buildings; Painting Ferrous Metals in Buildings; Painting of Cement Plastered Surfaces; and Industrial Floor Finishes. The bulletins provide a comprehensive, step-by-step set of instructions to accomplish each of the above projects.

PB82-875758 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Earth Sheltered Constructions. 1979-September, 1982 (Citations from the Energy Data Base).
Rept. for 1979-Sep 82.
Sep 82, 59p
Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the design and construction of earth sheltered buildings. Thermal and moisture protection, insulation, heating, and ventilation are discussed. Construction materials and cost factors are also considered. Incorporation of active and passive solar features are examined. Residential and non-residential buildings are discussed. (Contains 52 citations fully indexed and including a title list.)

PB82-876079 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Foundation Piles for Land Construction. December, 1976-September, 1982 (Citations from the Engineering Index Data Base).
Rept. for Dec 76-Sep 82.
Sep 82, 247p
Supersedes PB81-850240.

This bibliography contains citations concerning the design, analysis, and installation of piles for foundations on land. The articles address forces and stresses on piles during driving and under loaded conditions. Stresses also include those arising from earthquakes. Special subjects include techniques to overcome driving resistance, such as coating the pile and preboring the socket. This bibliography contains many citations from recent conferences on pile foundations, but limited to those in which the original paper is in English. (This updated bibliography contains 391 citations, 91 of which are new entries to the previous edition.)

14.

METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-A118 538/8 PC **A05**/MF **A01**
Alphatech, Inc., Burlington, MA.
Algorithms for Distributed Detection Given Waveform Observations.
Technical rept. 1 May 81-30 Apr 82,
Gregory S. Lauer, and Nils R. Sandell, Jr. 25 Jun 82, 100p TR-134, AFOSR-TR-82-0650
Contract F49620-81-C-0015

In this report the authors consider the problem of detection using geographically distributed sensors and limited communications. It is assumed that the sensor observations consist of Gaussian processes, the statistics of which depend upon the hypothesis. The cases considered include known and unknown signals corrupted by noise which may be correlated between sensors. A variety of numerical examples are given to illustrate the features of different detection algorithms. (Author)

AD-A118 566/9 PC **A03**/MF **A01**
Kulite Semiconductor Products, Inc., Ridgefield, NJ.
Kilobar Blast Pressure Transducer–3.4 Kilobar Piezoresistive Blast Pressure Sensor Using Silicon Load Cell Technique.
Final rept.,
Joseph R. Mallon, Jr. Jun 82, 45p AFWL-TR-81-224
Contract F29601-80-C-0005

Measurements of blast pressures in high-explosive experiments require highly specialized transducers. This report describes development of a resistance-based transducer for measurements to 3.4 kilobars. A unique transduction scheme employing a silicon cylinder incorporates diffused transverse piezoresistive elements to respond as a load cell to compressive stress. Considerations for hardening against blast thermal and shock accelerations are reflected in design of the unit. Five prototypes were fabricated and test results are presented. (Author)

AD-A118 587/5 PC **A03**/MF **A01**
Houston Univ., TX. Dept. of Electrical Engineering.
Electromagnetic Methods of Nondestructive Evaluation.
Final rept. 30 Sep 77-30 Apr 81,
Stuart A. Long, and A. B. El-Kareh. 18 May 81, 43p AFOSR-TR-82-0674
Grant AFOSR-77-3457

A study of quantitative nondestructive eddy current testing techniques on nonferromagnetic structural metals has been completed. In addition an investigation was made of electromagnetic surface wave propagation in a dielectric layer on a conducting substrate. (Author)

AD-A118 644/4 PC **A04**/MF **A01**
Air Force Weapons Lab., Kirtland AFB, NM.
Maintaining the Integrity of the TRESTLE Decking.
Final rept.,
Darren S. McKnight. Jul 82, 57p Rept no. AFWL-TR-82-29

This report examines methods of maintaining the integrity of the wood decking (top surface platform) of the TRESTLE Electromagnetic Pulse Simulator located at Kirtland AFB, New Mexico. Since the decking directly supports large aircraft during testing and is completely exposed to the weather its state is examined through a series of experiments which test the condition of the wood and coating, and moisture content levels in the wood. The decking is presently protected by a waterproof epoxy coating. This report looks at an alternative coating called Miracote and examines possible modes of protection other than the use of coatings. (Author)

AD-A118 704/6 PC **A05**/MF **A01**
Arnold Engineering Development Center, Arnold AFS, TN.
1981 Calibration of the AEDC-PWT Aerodynamic Wind Tunnel (4T) at Mach Numbers from 0.1 to 1.3.
Final rept. 18-24 Mar 81,
Wallace Luchuk, Charles F. Anderson, and Melvin L. Homan. Aug 82, 87p Rept no. AEDC-TR-82-10
Prepared in cooperation with Calspan Field Services, Inc., Arnold AFS, TN. AEDC Div.

The Propulsion Wind Tunnel facility Aerodynamic Wind Tunnel (4T) has been recalibrated. Measurements of the tunnel centerline Mach number distributions and tunnel calibration parameter have been obtained over a Mach number range from 0.1 to 1.3. The bulk of the Mach number measurements was made at a total pressure of 1,200 psfa, with other measurements taken at pressures ranging from 600 to 3,100 at selected Mach numbers. Data were obtained for tunnel wall porosities of 4, 5, and 6 percent over the entire Mach number range and for wall porosities ranging from 1 to 7 percent at selected transonic Mach numbers. Results of previously obtained flow angularity measurements in the test section made over a Mach number range of 0.4 to 1.3 are presented. Effects of honeycomb geometry and asymmetric wall porosity on the mean flow angles and on the standard deviations in flow angles are also presented. (Author)

AD-A118 736/8 PC **A02**/MF **A01**
Naval Ocean Research and Development Activity, NSTL Station, MS.
Comparison of Multichannel and Two-Satellite Methods for Remote Measurement of Sea Surface Temperature.
Final technical note,

Ron Holyer, and Jeff Hawkins. Jul 82, 16p Rept no. NORDA-TN-162

Atmospheric correction of IR satellite data for retrieval of sea surface temperatures (SST) by means of differential absorption can take on two forms. The most popular method utilizes changes in the spectral transmittance of the atmosphere between two or more IR channels (multichannel). The second form employs path length differences in the same spectral band using two satellites. The multichannel and two satellite approaches are applied to coincident imagery and in situ data and compared.

AD-A118 752/5 PC **A06**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Development of an Ion Mass Spectrometer and Sounding Rocket System for D-Region Cluster-Ion Measurements.
Instrumentation papers,
A. Bailey, R. Narcisi, L. Wlodyka, G. Federico, and E. McKenna. 27 Jan 82, 105p Rept nos. AFGL-TR-82-0022, AFGL-IP-309

An Ion Mass Spectrometer and supporting Sounding Rocket System were developed to make in situ measurements of cluster-ions in the D-region of the ionosphere. A cryogenically vacuum-pumped quadrupole mass filter and secondary emission ion counter are coupled to make mass spectral measurements of positive and negative ion composition in ambient gas sampled at the apex of a cone designed to attach the shock wave induced by supersonic sounding rocket speeds. (Author)

AD-A118 767/3 PC **A03**/MF **A01**
Analytics, Inc., Bloomington, IN.
Development of a System to Invert Eddy-Current Data and Reconstruct Flaws.
Final rept.,
Harold A. Sabbagh, and L. David Sabbagh. 18 Jun 82, 49p Rept no. TR-2-82
Contract N60921-81-C-0302

Starting from rigorous electromagnetic theory, a model for the inversion of eddy-current data to reconstruct flaws in circular cylindrical tubes is developed. The form of the model consists of integral equations, whose kernels (Green's functions) are computed using Fourier transforms. The unknowns in the principal integral equation are the conductivity and electric field in the flawed region. Because these unknowns appear multiplied together, the problem is really nonlinear. The integral equations are converted to algebraic (vector-matrix) form by means of the method of moments. The inversion process is completed by applying linear and nonlinear least-squares algorithms, that are contained in the commercially available LINPACK/MINPACK software packages, to these algebraic equations. Using these algorithms in the model, we have reconstructed numerically-generated flaws with great accuracy, both when the flaws are 'deterministic' and 'random', the latter with data that has been perturbed by as much as 20%. Examples of these inversions, using both the linear and nonlinear algorithms, are presented. In addition, the model can be extended in a straightforward way to include the effects of known irregularities, such as tube supports or tube-flaring, on the reconstruction of flaws. (Author)

DE82013995 MF **A01**
Lawrence Livermore National Lab., CA.
Current Developments in High-Resolution X-Ray Measurements.
D. T. Attwood, N. M. Ceglio, and H. M. Medecki. 30 Apr 82, 25p UCRL-87540, CONF-820336-6
Contract W-7405-ENG-48
Optical Society of America topical meeting on laser techniques for extreme ultraviolet spectroscopy, Boulder, CO, USA, 8 Mar 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Recent developments in high resolution x-ray measurements are reviewed. Among the more interesting developments are sub-1000A x-ray images, multilayer x-ray interference coatings, free standing transmission gratings, 20 psec soft x-ray streak cameras, normal incidence x-ray mirrors, and tabulated atomic scattering factors.

DE82014318 PC **A02**/MF **A01**
Ames Lab., IA.
Present Status and Future Needs for Quantitative Measurement Techniques.
R. B. Thompson. 1981, 20p IS-M-370, CONF-810839-13
Contract W-7405-ENG-82
AF/DARPA review of progress in quantitative NDE, Boulder, CO, USA, 2 Aug 1981, Portions of document are illegible.
Microfiche only after original copies are exhausted.

A quantitative evaluation of a material's remaining lifetime or strength depends critically on the ability to nondestructively measure failure related properties such as sizes of discrete flaws, extent of microscopic damage, and stress levels. In this paper the present status of quantitative techniques to measure such parameters is reviewed. It is reported that substantial progress is being made toward the development of techniques for sizing discrete flaws using ultrasonic and electromagnetic techniques. Under ideal conditions, excellent results have been reported. Under less ideal conditions, degradations in sizing accuracy occur due to a variety of causes, including irregular flaw shapes, complex part geometries, and the ill posed data inversion problem. The present status of understanding of the nature and magnitude of these causes is discussed, and the need for probabilistic outputs is emphasized. A brief summary of the status of techniques to measure distributed properties, such as microscopic damage and residual stress, is presented. This paper concludes with a discussion of future directions where research is needed to bring measurement capabilities to the necessary level.

DE82014324 PC **A02**/MF **A01**
Ames Lab., IA.
Effects of Closure on the Detection Probability of Fatigue Cracks.
O. Buck, and B. J. Skillings. 1981, 5p IS-M-366, CONF-810839-11
Contract W-7405-ENG-82
AF/DARPA review of progress in quantitative NDE, Boulder, CO, USA, 2 Aug 1981, Portions of document are illegible.
Microfiche only after original copies are exhausted.

This paper addresses the causes for a reduced acoustic detection probability of more or less tightly closed cracks. For this purpose an initial model of the closure behavior of a fatigue crack is formulated. Crack opening displacement measurements are used to substantiate this model semiquantitatively. It is concluded that the crack will be kept open over small portions of the total crack surface due to asperities on the fracture surfaces and a wedging at the crack tip due to the deformed material in the plastic zone. As a result, the crack tip can still be observed by appropriate techniques, even if the crack is tightly closed. The effects of closure on the transmission and reflection of acoustic surface waves will be reported.

DE82015389 PC **A04**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Handbook of Optical Testing Methods for Diamond-Turned Mirrors. Volume 2.
R. E. Sladky. 31 May 82, 61p Y-2258
Contract W-7405-ENG-26

The information in this report should be most useful to technical testing large metal mirrors and to the manufacturing engineers who have the responsibility for diamond turning high-quality optical components. The effects of lenses in forming and altering wavefronts are discussed so that the tester will be aware of all the circumstances responsible for generating an interferogram. Both visual and computer interpretation of the interferogram are discussed, with emphasis on the necessity for proper understanding of the test so that the computer result will be accurate. The axicon is an optical shape which is unfamiliar to most testers. Special considerations for testing and evaluating the errors of this element are described.

DE82016028 PC **A02**/MF **A01**
Bendix Corp., Kansas City, MO.
Electronics Tester Study. Final Report.
D. L. Cogan. May 82, 12p BDX-613-2700
Contract AC04-76DP00613
Microfiche only after original copies are exhausted.

A study was initiated to investigate and determine the optimum means of upgrading the capability and capacity of an existing development electronic product test system to meet anticipated workload requirements, and at the same time enable the departmental technical staff to increase productivity. The study determined that a multiple hardware interface capability will be needed to support the anticipated workload. A greater data manipulation capability also is needed to analyze and display information, and an increase in directly addressable program space is needed to eliminate the need for users of the system to understand the complexities of the operating system.

DE82903109 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Trisaia (Italy). Dipartimento Ciclo del Combustibile.
Criticality Studies of ITREC Plant Hot Cell Using KENO IV and MORSE-CG Monte Carlo Codes.
F. Siciliano, and T. Abbas. Oct 80, 26p CNEN-RT/ING-(80)21
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

This report presents the criticality calculations of ITREC plant hot cell under normal plant operation. The criticality calculations have been performed with KENO IV and MORSE-CG Monte Carlo codes using 123 group AMP XII library and 16 group Hansen Roach data sets. The results produced by both codes are in good accordance and show that under normal operation the system is quite safe as far as the nuclear criticality safety is concerned. (ERA citation 07:044331)

DE82903129 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
Method for the Absolute Measurement of Reflectivity.
G. Emiliani, and M. Varasi. May 81, 19p CNEN-RT/FI-(81)9
In Italian.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

A method is introduced for reflectivity measurement, which does not rely on the knowledge of reference mirror reflectivity. The method is based on a single reflection on the sample, so a better spatial definition and a good sensitivity for low reflectivity values, is obtained. (ERA citation 07:044572)

N82-29345/7 PC **A18**/MF **A01**
Battelle Columbus Labs., OH.
Preliminary Feasibility Assessment for Earth-to-Space Electromagnetic (Railgun) Launchers.
Final Technical Report, May 1981 - Jun. 1982.
E. E. Rice, L. A. Miller, and R. W. Earhart. 30 Jun 82, 403p NASA-CR-167886, NAS 1.26:167886
Contract NAS3-22882

An Earth to space electromagnetic (railgun) launcher (ESRL) for launching material into space was studied. Potential ESRL applications were identified and initially assessed to formulate preliminary system requirements. The potential applications included nuclear waste disposal in space, Earth orbital applications, deep space probe launchers, atmospheric research, and boost of chemical rockets. The ESRL system concept consisted of two separate railgun launcher tubes (one at 20 deg from the horizontal for Earth orbital missions, the other vertical for solar system escape disposal missions) powered by a common power plant. Each 2040 m launcher tube is surrounded by 10,200 homopolar generator/inductor units to transmit the power to the walls. Projectile masses are 6500 kg for Earth orbital missions and 2055 kg for nuclear waste disposal missions. For the Earth orbital missions, the projectile requires a propulsion system, leaving an estimated payload mass of 650 kg For the nuclear waste disposal in space mission, the high level waste mass was estimated at 250 kg. This preliminary assessment included technical, environmental, and economic analyses.

N82-29373/9 PC **A02**/MF **A01**
Houston Univ., TX. Dept. of Chemistry.
Development of and Fabrication of High Resolution Gas Chromatographic Capillary Columns.
Final Report.
A. Zlatkis. May 82, 24p NASA-CR-167631, NAS 1.26:167631
Contract NAS9-16351

Gas chromatographic columns which are used in the trace gas analyzer (TGA) for the space shuttle are coated with a polyoxyethylene lauryl ether. This stationary phase is of medium polarity and has a tempera-

ture limit of 160 C. A polymer for this application which has an improved thermal stability is investigated. The use of fused silica capillary columns with specially bonded phases as well as an introduction system (on column) was also studied.

N82-29548/6 PC **A02**/MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Fast-Slow Coincidence Systems with Very High Time Resolution.
I. Naday, Z. Kajcsos, G. Kozma, and M. Kanyo. Feb 81, 14p DE81-700541, KFKI-1981-11
In English; Hungarian Summary. Presented at the 10TH Intern. Symp. On Nucl. Electron., Dresden, N.D.

The measuring of very short times recently became increasingly important. The authors describe their studies on the various parts of a timing system in an attempt to improve its parameters. The detector system, i.e. the transit time differences of the photomultipliers, the construction of the divider network, the various types of timing discriminators, the time-to-pulse height converters and the gating system were investigated. Two types of constant fraction discriminators are introduced: one for general timing applications, the other placed inside the detector head for positron lifetime measurements.

N82-29556/9 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Correlation of Preston-Tube Data with Laminar Skin Friction (Log No. J12984).
T. D. Reed, A. Abu-mostafa, and F. W. Steinle, Jr.. 18 Jan 82, 37p NASA-TM-84827, NAS 1.15:84827
Grant NSG-2396, Contract NAG2-76
Backup Document for Aiaa Synoptic Scheduled for Publication in Aiaa Journal in Feb. 1983.

Preston tube data within laminar boundary layers obtained on a sharp ten-degree cone in the NASA Ames eleven-foot transonic wind tunnel are correlated with the corresponding values of theoretical skin friction. Data were obtained over a Mach number range of 0.30 to 0.95 and unit Reynolds numbers of 9.84, 13.1, and 16.4 million per meter. The rms scatter of skin friction coefficient about the correlation is of the order of one percent, which is comparable to the reported accuracy for calibrations of Preston tubes in incompressible pipe flows. In contrast to previous works on Preston tube/skin friction correlations, which are based on the physical height of the probe's face, this satisfactory correlation for compressible boundary layer flows is achieved by accounting for the effects of a variable 'effective' height of the probe. The coefficients, which appear in the correlation, are dependent on the particular tunnel environment. The general procedure can be used to define correlations for other wind tunnels.

N82-29577/5 PC **A15**/MF **A01**
Systematics General Corp., McLean, VA.
Handbook of Sensor Technical Characteristics.
S. Tanner. Jul 82, 333p NASA-RP-1087, NAS 1.61:1087
Contract NASW-3398

Space and terrestrial applications remote sensor systems are described. Each sensor is presented separately. Information is included on its objectives, description, technical characteristics, data products obtained, data archives location, period of operation, and measurement and potential derived parameters. Each sensor is cross indexed.

N82-29578/3 PC **A05**/MF **A01**
Lockheed Missiles and Space Co., Inc., Sunnyvale, CA.
Compact Magnetograph.
Final Report.
A. M. Title, B. A. Gillespie, and J. W. Mosher. Feb 82, 98p LMSC/D834896, NASA-CR-169193
Contract NASW-3457

A compact magnetograph system based on solid Fabry-Perot interferometers as the spectral isolation elements was studied. The theory of operation of several Fabry-Perot systems, the suitability of various magnetic lines, signal levels expected for different modes of operation, and the optimal detector systems were investigated. The requirements that the lack of a polarization modulator placed upon the electronic signal chain was emphasized. The PLZT modulator was chosen as a satisfactory component with both high reliability and elatively low voltage requirements. Thermal control, line centering and velocity offset problems were solved by a Fabry-Perot configuration.

N82-29581/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Phase Linear Interferometer Experiment Maintenance and Calibration Manual.
S. J. Goodman. Jun 82, 14p NASA-TM-82486, NAS 1.15:82486

This manual describes the necessary procedures for assuring continuous lightning sferics data collection at Marshall Space Flight Center. The phase linear interferometer experiment is under evaluation as a candidate RF sensor to support the space based optical lightning mapper system.

PAT-APPL-6-379 806 PC **A03**/MF **A01**
Department of the Air Force, Washington, DC.
Mounting Arrangement for an Inertial Measurement Unit.
Patent Application,
Kurt D. Shenkle. Filed 19 May 82, 26p AD-D009 631/3
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

In a mounting arrangement for an instrument, such as an inertial measurement unit, a mounting frame is pivotably mounted to a platform for rotation about a vertical axis and a support frame is rotatably mounted to the mounting frame for rotation about a horizontal axis. The support frame supports the instrument. A horizontal lock and motion assembly interconnects the mounting frame and platform, and allows adjustment of the angular position of the mounting frame about the vertical axis relative to the platform when the mounting frame is looked to the platform. A vertical lock and motion assembly interconnects the support frame and mounting frame, and allows adjustment of the angular position of the support frame about the horizontal axis relative to the mounting frame when the support frame is locked to the mounting frame. (Author)

PAT-APPL-6-386 488 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
System and Method for Dynamically Recording Distortion in a Transparency.
Patent Application,
Harry L. Task. Filed 9 Jun 82, 16p AD-D009 645/3
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A method and system for dynamically recording distortion in a transparency for movement about a predetermined horizontal or vertical axis, with a camera disposed in back of the transparency while a test target is disposed in front of it. The test target has a plurality of small light sources arranged in a rectangular matrix pattern toward which the camera is aimed through the transparency. By opening the camera shutter for a period of time as the transparency is moved through a predetermined angle, a photographic record of distortion at a plurality of regions in the transparency is produced. (Author)

PATENT-4 343 189 Not available NTIS
Department of Agriculture, Washington, DC.
Method and Apparatus for Edgewise Compression Testing of Flat Sheets.
Patent,
Dennis E. Gunderson. Filed 23 May 80, patented 10 Aug 82, 7p PB82-257999, PAT-APPL-6-152 874
Supersedes PB80-198161.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The patent describes a compressive creep test fixture of box-like structure having a rectangular opening for testing a specimen and a pair of ports for applying a vacuum. Rigid or semi-rigid elements, spaced from each other in a uniform manner, support the specimen at the rectangular opening during testing. The vacuum in the fixture holds the tested specimen in place on the support elements, and together the vacuum and support elements prevent buckling of very thin sheet materials under conditions of edgewise compressive loading.

PB82-261082 PC **A08**/MF **A01**
Technische Hogeschool, Delft (Netherlands).
Een Elektromagnetische Debietmeter: Ijking met Pulserende Stromingen (An Electromagnetic Flowmeter: Measurement of Pulsating Flow),
J. A. W. M. Corver. Oct 81, 175p MEAH-13
Text in Dutch. Errata sheet inserted.

Questions concerning the function of an electromagnetic flowmeter system have led to the calibration of the system in a pulsating flow of water through a cylindrical tube. As a reference, a laser-doppler-anemometer has been used. Significant differences have been found only when the lowest flowrates occurred. Those differences proved to be 5% of the maximum flowrate, which may be called acceptable in medical practice. Using the theory it is possible to give a plausible explanation for these differences.

PB82-261595 Not available NTIS
National Bureau of Standards, Washington, DC.
Heterodyne Detection of Phase-Conjugate Emission in An Ar Discharge with a Low-Power C.W. Laser.
Final rept.,
D. Bloch, R. K. Raj, J. J. Snyder, and M. Ducloy. Jan 81, 4p
Pub in Jnl. de Physique Lettres 42, n2 pL-31--L-34, 15 Jan 81.

The authors report the observation of nearly degenerate four-wave mixing in Ar gas discharges at 867 nm (transition 1s3 - 2p7) using a low power c.w. laser. The weak phase-conjugate emission has been observed by means of a heterodyne detection technique at 30 MHz. This experimental scheme should be able to yield ultimate shot-noise limited signals, and thus could be used as a sensitive tool for phase-conjugation studies.

PB82-261686 Not available NTIS
National Bureau of Standards, Washington, DC.
Traceable NDE Standards.
Final rept.,
G. Birnbaum, H. Berger, and D. G. Eitzen. Sep 81, 4p
Pub. in NTIAC Newsletter 9, n3 p1-4 Sep 81.

Recent work at the National Bureau of Standards which has lead to NDE standards and calibrations as well as work in progress is reviewed. The NDE areas discussed include acoustic emission, x-ray and neutron radiography, eddy current, magnetic particles, liquid penetrants, visual acuity testing and leak rate measurements.

PB82-261835 Not available NTIS
National Bureau of Standards, Washington, DC.
What is NBS Doing in NDE.
Final rept.,
Harold Berger. 1982, 5p
Pub. in Proceedings of Annual Quality Congress Transactions (36th), Westin Hotel, Detroit, MI, May 2-5, 1982, p929-933.

The National Bureau of Standards (NBS) has had an active program in nondestructive evaluation (NDE) for several years. The program has been directed toward the development of NDE standards and improved NDE measurement capabilities. Several NDE measurements are now traceable to NBS and others are planned. These procedures provide for more reliable NDE measurements in quality control programs.

PB82-262254 PC **A08**/MF **A01**
Intermountain Forest and Range Experiment Station, Ogden, UT.
A Calibration Model for Screen-caged Peltier Thermocouple Psychrometers.
Forest Service research paper,
Ray W. Brown, and Dale L. Bartos. Jul 82, 159p FSRP-INT-293

A calibration model for screen-caged Peltier thermocouple psychrometers was developed that applies to a water potential range of 0 to-80 bars, over a temperature range of 0 to 40C, and for cooling times of 15 to 60 seconds. In addition, the model corrects for the effects of temperature gradients over zero-offsets from -60 to +60 microvolts. Complete details of model develop-

ment are discussed, together with the theory of thermocouple psychrometers, and techniques of calibration and cleaning. Also, information for computer programing and tabular summaries of model characteristics are provided.

PB82-263021 PC **A11**/MF **A01**
Westat Research, Inc., Rockville, MD.
Indicators of Scientific Research Instrumentation in Academic Institutions: A Feasibility Study. Findings and Recommendations.
Final rept. 1980-81,
Kenneth Burgdorf, and Lance Hodes. Mar 82, 246p
NSF-SRS-8017873
Grant NSF-SRS80-17873

Mail questionnaires and personal interviews were used to develop sample data on characteristics of research equipment in four subdisciplines in 38 institutions of higher education: organic chemistry, cell biology, solid state physics, and electrical engineering. Value of equipment, use patterns, obsolescence, and other factors were key elements. Based on the findings contained in this report, Westat has recommended approaches for the National Science Foundation to implement a full-scale survey to determine national indicators of scientific instrumentation used in research and development at academic institutions of higher education.

PB82-263625 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC. National Engineering Lab.
An Accuracy Statement for a Facility Used to Calibrate Static Pressure Transducers and Differential Pressure Transducers at High Base Pressure,
C. F. Sindt, and J. F. LaBrecque. Jun 82, 45p NBS-TN-1052
Sponsored in part by American Gas Association, Inc., Arlington, VA., and Gas Research Inst., Chicago, IL.

A facility has been developed to calibrate pressure transducers that are used in the NBS Gas Mass Flow Facility. Both static and differential pressure transducers can be calibrated. An air dead weight tester is the standard for static transducers in the range from 3.8 to 4.5 MPa. An air dead weight tester is also the standard for the differential pressure transducers in the range of 2.5 kPa to 50 MPa; a cistern manometer. This, plus the uncertainties in the high pressure corrections to the cistern manometer and our measurement of the mercury temperature, contributes plus or minus 690 ppm to the uncertainty of the differential pressure transducer calibrations.

PB82-264003 Not available NTIS
National Bureau of Standards, Washington, DC.
An Analytical Expression for the Evaluation of Leakage Current in the Integrated Gated-Diode Electrometer.
Final rept.,
Gary P. Carver, and Martin G. Buehler. Dec 80, 8p
Pub. in IEEE Trans. Electron Devices ED-27, n12 p2245-2252 Dec 80.

The integrated gated-diode electrometer microelectronic test structure permits automated measurement of leakage currents in p-n junctions. The test method incorporates on-chip signal processing using an electrometer amplifier. An analysis of the equivalent circuit, which includes the effects of loading by the electrometer, yields the working equations required for the interpretation of the measurements and the determination of the generation lifetime and surface-recombination velocity. In certain situations, the generation lifetime can be determined independently of the diode area, allowing the device size to be scaled down without sacrificing the signal amplitude.

PB82-264177 Not available NTIS
National Bureau of Standards, Washington, DC.
An Accurate Temperature-Controlled Polarimeter.
Final rept.,
A. L. Cummings, and R. J. Hocken. Jan 82, 6p
Pub. in Precision Engineering 4, n1 p33-38 Jan 82.

A photoelectric polarimeter has been constructed for the purposes of calibrating polarimetric standards and for redetermining the value for the specific rotation of sucrose in solution. In this paper we present the design details of this polarimetric system. The design required the careful application of high precision manufacturing techniques coupled closely with metrology throughout the manufacturing process.

PB82-264219 Not available NTIS
National Bureau of Standards, Washington, DC.
The Metric System: Its Status and Future.
Final rept.,
David T. Goldman. Apr 82, 4p
Pub. in IEEE Spectrum 18, n4 p60-63 Apr 82.

No abstract available.

PB82-264268 Not available NTIS
National Bureau of Standards, Washington, DC.
Nondestructive Evaluation of Large Diameter Girth Welds Using Electromagnetic-Acoustic Transducers.
Final rept.,
C. M. Fortunko, and R. E. Schramm. 1982, 9p
Sponsored in part by Department of Transportation, Washington, DC.
Pub. in Proceedings of Fitness for Purpose Validation of Welded Constructions, London, England, November 17-19, 1981, p P20-1-P20-8 1982.

A new ultrasonic inspection technique is described to detect elongated defects in butt welds. The technique uses noncoupling, electromagnetic-acoustic transducers (EMATs) which can operate on most unprepared surfaces and under adverse environmental conditions. The operation of the new technique is demonstrated in the context of the detection and sizing of elongated, two-dimensional defects in girth welds of 48in. diameter cross-country pipeline. The ultrasonic inspection is carried out at 454kHz using shear wave signals polarized in the plane of the weld (SH waves).

PB82-264292 Not available NTIS
National Bureau of Standards, Washington, DC.
Extended Variational Solution for Scattering from Flaws in Plates.
Final rept.,
R. B. King, and C. M. Fortunko. May 82, 2p
Sponsored in part by United Engineering Center, New York.
Pub. in Jnl. of Applied Physics 53, n5 p3459-3460 May 82.

A variational solution is obtained for scattering of horizontally polarized shear (SH) waves from cracks in plates. The solution permits a trial function for the displacement jump across the crack in the form of a series with arbitrary coefficients to be inserted in the variational expression for the scattering coefficients. This multiple term variational solution is preferable to one term solutions when increased accuracy is desired or when the form of the displacement jump across the crack is not apparent. Numerical results are presented for scattering from edge cracks in plates.

PB82-264326 Not available NTIS
National Bureau of Standards, Washington, DC.
Nondestructive Evaluation of Planar Defects in Plates Using Low Frequency Shear Horizontal Waves.
Final rept.,
C. M. Fortunko, R. B. King, and M. Tan. May 82, 9p
Sponsored in part by Department of Transportation, Washington, DC. and United Engineering Center, New York.
Pub. in Jnl. of Applied Physics 53, n5 p3450-3458 May 82.

An ultrasonic technique is described that allows the determination of the through-thickness dimension and limited localization of planar defects (cracks) in an isotropic metal plate. The scattering of horizontally polarized shear plate waves by edge and buried planar defects is investigated using a variational integral expression. Numerical results are presented that allow the calculation of the SH plate wave signal amplitudes as a function of defect through-thickness dimension and location within a plate for two-dimensional cracks. It is shown that SH waves are particularly useful for detecting and sizing of crack-like defects. In addition, it is demonstrated that in plates, which can support a number of propagating SH plate waves, it is also possible to determine the relative position of a defect from interference phenomena. The numerical results are confirmed experimentally using an electromagnetic-acoustic transducer system to generate and detect 454-kHz SH wave signals along the meridian of a 1.22-m diameter steel pipe with a 15.9-mm wall thickness. The experimental results demonstrate the efficacy of using SH wave signals in quantitative nondestructive evaluation of butt welds.

PB82-264334 Not available NTIS
National Bureau of Standards, Washington, DC.
Ultrasonic Nondestructive Evaluation of Butt-Welds Using Electromagnetic-Acoustic Transducers.
Final rept.,
C. M. Fortunko, and R. E. Schramm. Feb 82, 8p
Sponsored in part by Department of Transportation, Washington, DC.
Pub. in Welding Jnl., p39-46 1982.

A new ultrasonic inspection technique is described for detecting elongated defects in butt welds. The technique uses noncoupling, electromagnetic-acoustic transducers (EMAT's) that can operate on most unprepared surfaces and under adverse environmental conditions. The operation of the new technique is demonstrated in the context of detection and sizing of elongated, two-dimensional defects in girth welds of 1.22-m (48-in) diameter cross-country pipeline. The ultrasonic inspection is carried out at 454 kHz using shear-wave signals polarized in the plane of the weld (SH-waves). The advantage of ultrasonic weld inspection at low frequencies (long wavelengths) is that the reflected ultrasonic amplitude is relatively insensitive to defect orientation and surface roughness.

PB82-264391 Not available NTIS
National Bureau of Standards, Washington, DC.
Sizing of Surface Cracks in a Plate Using SH Waves.
Final rept.,
S. K. Datta, C. M. Fortunko, and R. B. King. Dec 81, 5p
Sponsored in part by United Engineering Center, New York.
Pub. in Proceedings of 1981 Ultrasonics Symposium, Chicago, IL, October 14-16, 1981, p863-867 Dec 81.

The diffraction of SH waves by two-dimensional surface cracks in isotropic plates is studied in two different ways. First, a variational integral expression is used to calculate the reflection coefficients of the propagating modes. The scattered fields away from the crack are then obtained using modal superposition. Second, a combined finite element-analytical technique is used to calculate the scattered fields. The results of the two calculations are compared for the case of shallow cracks in the long wavelength limit. The theoretical results are also compared with experimental data that have been obtained using a low frequency (454 kHz) electromagnetic-acoustic transducer (EMAT) system. It is shown that SH waves may be particularly appropriate for detecting and sizing elongated planar defects in butt welds.

PB82-264417 Not available NTIS
National Bureau of Standards, Washington, DC.
Improvement in Flaw Detection in Austenitic Stainless Steel Weldments.
Final rept.,
R. K. Elsley, and C. M. Fortunko. Dec 81, 8p
Pub. in Proceedings 1981 Ultrasonics Symposium, Chicago, IL. October 14-16, 1981, p892-899 Dec 81.

Inspection of austenitic stainless steel weldments by conventional ultrasonic means is fundamentally limited by the textured columnar grain structure of the weld metal. It is shown that for selected angles of incidence, shear waves polarized normal to the columnar grains can pass through the weld metal-base metal interface without partial reflection. As a consequence, the inspectability of stainless steel weldments can be improved. The use of low frequency probing signals is advantageous because it reduces the influence of nonuniform textures at the weld metal-base metal interface. The operation of a low frequency, ultrasonic system for stainless steel butt weldments using electromagnetic acoustic transducers (EMATs) is demonstrated. Digital signal processing techniques including signal averaging, subtraction and synthetic aperture imaging are used to further improve inspectability.

PB82-264458 Not available NTIS
National Bureau of Standards, Washington, DC.
Diffraction of Medium and Long Wavelength Horizontally Polarized Shear Waves by Edge Cracks.
Final rept.,

S. K. Datta, A. H. Shah, and C. M. Fortunko. Apr 82, 8p
Sponsored in part by Department of Transportation, Washington, DC. and United Engineering Center, New York.
Pub. in Jnl. of Applied Physics 53, n4 p2895-2902 Apr 82.

Scattering of horizontally polarized shear (SH) waves by edge cracks of length l and of different orientations relative to the free surface of the half-space is studied. A combined finite element and analytical technique is presented that is suitable for analyzing scattering by cracks or inhomogeneities in a semi-infinite elastic medium. Attention is focused in the range of wavelengths, lambda, when the ratio, l/lambda is < or = 1/2. Numerical results are presented for crack opening displacements and scattered fields on the surface when the medium is homogeneous or when the crack is located in an insert with different material properties. Comparison of the theoretical solution is also made with available experimental results. The experimental results are obtained using electromagnetic-acoustic transducers (EMAT's) that can efficiently generate and detect low frequency SH-waves in metals. The results are applicable to sizing and characterization of weld defects. Recent experimental evidence suggests that this can be accomplished when the wavelength is of the order of twice the crack length or longer.

PB82-265620 Not available NTIS
National Bureau of Standards, Washington, DC.
Optimized Wavelength-Sized Scalar Horns as Antenna Radiation Standards.
Final rept.,
A. J. Estin, C. F. Stubenrauch, A. G. Repjar, and A. C. Newell. Mar 82, 6p
Pub. in Institute of Electrical and Electronics Engineers Transactions on Instrumentation and Measurement IM-31, n1 p53-56 Mar 82.

The properties of beamwidth, directivity, and polarization of wavelength-size scalar horns are analyzed and optimized theoretically and confirmed experimentally to determine the usefulness of such horns as standards. Agreement between theoretical predictions and measurements was good.

PB82-875246 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Acoustic Emission Signal Analysis. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 150p
Supersedes PB82-853417.

This bibliography contains citations on the detection, monitoring, and analysis of acoustic emission signals occurring during evaluation tests of different metals. Innovative methods, instrumentation, and recording devices for acoustic emission analysis; generation and propagation mechanisms of acoustic emissions; and pattern recognition techniques relative to signal classification technology are among the topics discussed. Applications for acoustic emission signal tests are included for electrical and mechanical engineering. (This updated bibliography contains 133 citations, 29 of which are new entries to the previous edition.)

PB82-875923 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Temperature Measurement: Technology and Standards. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 160p

This bibliography contains citations concerning technology and standards of temperature measurement. Design and characteristics of temperature sensors and measuring devices are discussed. Measurement and instrument errors are considered. Temperature measuring techniques and standards for industry and scientific research are included. (Contains 153 citations fully indexed and including a title list.)

PB82-876350 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Radiometers. April, 1978-September, 1982 (Citations from the NTIS Data Base).
Rept. for Apr 78-Sep 82.
Sep 82, 273p
Supersedes PB80-854516.

This bibliography contains citations concerning the design and application of radiometers. The application of radiometry to various topics such as, solar radiation measurements, critical temperature measurements, and infrared surveying are discussed. (This updated bibliography contains 231 citations, 59 of which are new entries to the previous edition.)

14D. Reliability

AD-A118 839/0 PC **A07**/MF **A01**
Hughes Aircraft Co., Culver City, CA.
RADC Thermal Guide for Reliability Engineers.
Final technical rept. 23 Dec 80-23 Jan 82,
Gerald N. Morrison, James M. Kallis, Landon A. Strattan, Ivan R. Jones, and August L. Lena. Jun 82, 134p HAC-FR-81-70-778, RADC-TR-82-172
Contract F30602-81-C-0033

This guide was developed to provide a reliability engineer, who is not proficient in thermal design and analysis techniques, with the tools for managing and evaluating the thermal design and production of electronic equipment. It defines the requirements and tasks that should be addressed in system equipment specifications and statements of work, and describes how to evaluate performance. (Author)

PB82-261868 Not available NTIS
National Bureau of Standards, Washington, DC.
Inservice Data Reporting Standards for Engineering Reliability and Risk Analysis.
Final rept.,
Jeffrey T. Fong. 1980, 6p
Pub. in Nuclear Engineering and Design 60, p159-161 1980.

On two recent occasions, structural and mechanical engineers were challenged either to come up with a solution to the data base problem of the reliability analysis methodology or to avoid using the tool as a serious mathematical model to resolve issues of safety and productivity. This paper is a direct response to the challenge. The notion of an adequate data base is first defined in terms of three essential elements. It is then demonstrated via a medical analogy that an 'optimal' plan of data reporting and some national or international standards for such reporting are desirable. A formula for estimating variabilities based on a combination of inservice and failure data is proposed.

PB82-261876 Not available NTIS
National Bureau of Standards, Washington, DC.
Inservice Data Reporting and Analysis for Pressure Vessels, Piping, Pumps and Valves.
Final rept.,
Jeffrey T. Fong. 1978, 6p
Pub. in Proceedings of Winter Annual Meeting of American Society of Mechanical Engineers, San Francisco, CA, December 10-15, 1978, piii-vi.

The goals of the symposium are: (a) To examine, on a world-wide basis, the current status of reporting, collection, and evaluation of failure data on pressure vessels, piping, pumps, and valves for the purpose of improving the science of estimating the probability of infrequent events such as the failure of mechanical components, (b) to discuss the various approaches currently used world-wide for reliability data collection and reporting on mechanical components in nuclear powerplants to ensure suitability of data to risk analysis. This special publication contains the original manuscripts of 20 contributors from France, Germany, United Kingdom, and United States in the form of 13 technical papers.

14E. Reprography

AD-A118 832/5 PC **A06**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
The Army's Penny-Wise, Pound-Foolish Publications System: A Prescription for Change.
Study project,
Raymond F. Milwee, Jr. 7 Jun 82, 103p

This study is about the impact on the Army that results from the process it uses in publishing regulatory publications. Using 1981 Distribution A + B activity measurements, the study provides insights on manpower burdens, systemic time lapses, direct and buried costs and alternatives for relief from adverse conditions produced by the process. It demonstrates that the cost of publishing small unit regulations is nearly $55,000,000 per year, 94% of which is shown to be unmanaged. The study indicates change for a savings approaching 91% of present cost. The study advocates immediate action to establish a publications policy that balances service between the needs of proponents, publishing agents, and consumer-units. It identifies the development of a contracted, electronic composition-assisted, integrated production system and the ultimate substitution of a throw-away publications and indirect costs. The study makes first published use of the Watson Cycle, an observed phenomenon involving informational disconnects that are catalyzed in large bureaucracies, notably the U.S. Army, by unservicable regulation publishing arrangements. (Author)

PB82-263310 PC **A02**/MF **A01**
Bureau of Radiological Health, Rockville, MD.
A Sensitometric Evaluation of Film-Chemistry-Processor Systems in the State of New Jersey.
Final rept.,
Orhan H. Suleiman, Charles K. Showalter, George H. Koustenis, and Eileen Hotte. Apr 82, 22p DHEW/PUB/FDA-82-8189, FDA/BRH-82/70

A sensitometric evaluation of film-chemistry-processor systems in medical x-ray facilities was carried out in the State of New Jersey. Processor operating parameters such as developer temperature were measured and sensitometric indices (Base + Fog, sensitometric speed step corresponding to speed density, and average gradient) were determined for both control film and film routinely used in each facility processed in each chemistry-processor system. Sensitometric speed varied in excess of a four-fold range of sensitometric exposure. This would correspond to a four-fold range of patient exposure for a given image receptor.

15.

MILITARY SCIENCES

15B. Chemical, Biological, and Radiological Warfare

AD-A118 673/3 PC **A02**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Chemical Systems Lab.
Installation of Substitute E45R2 (4800 CFM) Gas-Particulate Filters in Laboratory Ventilation Systems.
Special publication Nov-Dec 79,
Michael Schumchyk, Arthur T. Shacter, Robert R. Gavlinski, Edward F. Colburn, and Christian Gardner. Aug 82, 19p ARCSL-SP-82005, SBI-AD-E410 570
See also Rept. no. ARCSL-TR-80006, AD-B046 903L and Rept. no. ARCSL-SP-81016, AD-B061 386L.

Two E45R2 Gas Particulate Filter Units (2400 cfm each) were successfully recovered from E-1 Nike Hercules Collective Protective Systems, modified into a

4800 cfm filter system and installed in a laboratory ventilation system. (Author)

15C. Defense

PB82-261967 PC **A03**/MF **A01**
National Technical Information Service, Springfield, VA.
Readiness of the U.S. Coast Guard.
18 Aug 82, 26p GAO/PLRD-82-98, B-207216

Continuing problems may prevent the Coast Guard from successfully carrying out its ongoing peacetime missions and assuming additional tasks to support Navy operations in wartime. Specifically, GAO found difficulties in assigning the Coast Guard wartime tasks to support Navy operations and in developing viable plans for carrying out the tasks; readiness problems which impair peacetime operations and which would affect Coast Guard performance of wartime missions, and a need to better coordinate the Coast Guard's port security wartime mission with other Federal agencies and to improve the peacetime Reserve training program and planning for the logistical support of the Reserves at mobilization. This report contains several recommendations to improve Coast Guard readiness.

15E. Logistics

AD-A118 737/6 MF **A01**
AAI Corp., Cockeysville, MD.
Engineering Development Tests Airdrop Controlled Exit System (ACES).
Technical rept. Oct 79-Apr 80,
Walter L. Black. Sep 80, 190p AAI-ER-10646, NATICK-TR-82/017
Contract DAAK60-77-C-0076
Availability: Microfiche copies only.

A series of engineering development tests of the Airdrop Controlled Exit System (ACES) was conducted at the Army's Yuma Proving Ground, Arizona. The concept involves connecting individual platform assemblies so that they are extracted from the aircraft in tandem and recovered as a unit with a set of recovery parachutes. The purpose is to avoid the dispersion of the equipment on the drop zone that occurs when performing individual platform airdrops. Fourteen tests were performed on ACES assemblies of various configurations. The equipment performed in a generally satisfactory manner. Telemetered data generated by on board instrumentation provided loads at various locations plus motion of the platforms relative to one another. Parachute performance, system trajectories, and motion of the assemblies was monitored by theodolite and motion picture cameras.

AD-A118 804/4 PC **A03**/MF **A01**
Defence Research Establishment Ottawa (Ontario).
Measurement of the Combined Heat and Water-Vapour Flow through Clothing under Transient Conditions.
Technical note,
Brian Farnworth, and Bjarne Nordli. Mar 82, 29p
Rept no. DREO-TN-82-13
Abstract in French.

A sweating hot plate for the study of combined heat and water-vapour flow through clothing under Transient conditions is described. The results are in good agreement with the mathematical model reported in a previous paper for several model clothing systems. The heat loss through wool clothing was found to be smaller than that through similar polyester clothing during periods of sweating and larger during subsequent periods of drying, because of the effects of absorption of water vapour by hygroscopic materials. A comparison was made of the heat and vapour transmission of the clothing systems by incorporating a vapour-impermeable fabric or the waterproof but vapour-permeable fabric Gore-Tex. Liquid water was observed to condence on the inner surface of both fabrics during periods of sweating but the Gore-TEx dried within a few minutes of the end of the sweating period. Gore-Tex was found to be vapour permeable even at temperatures below 0 degrees C when frost was forming on its inner surface. (Author)

AD-A118 849/9 PC **A03**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Airlift Support of the High Tech Light Division in the Contingency Area.
Study project,
Larry D. Parsons. Jun 82, 29p

The HTLD (High Tech Light Division) is a very mobile force. It is designed to be so. The maneuver units will rely on very lethal weapons and mobility to survive. The high tech units will be very light. The entire division will be designed to fit on 1,000 C141B sorties. As a result, the division will have less self-contained resupply capability. The tactics to be used by the HTLD will cause the divisional units to range over greater distances than do those in a conventional division. The combination of increased mobility, greater distances between units, and less intrinsic resupply capability will increase the HTLD reliance on tactical airlift. The tactics planned for the HTLD and the contingency area designated for it place unusual demands on tactical airlift. The support will have to be more flexible because of the fluid battlefield. Short notice changes to support requirements will be more common. There will be an increased requirement for delivery by LAPES and CDS where LZs are not available.

15F. Nuclear Warfare

PB82-876178 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nuclear Warfare: Survival. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 196p
Supersedes PB81-871410.

This bibliography contains citations concerning various factors and systems relating to both military and civilian personal and general survival in nuclear warfare. Vulnerability and security of people, material, and systems are considered as well as their survivability. A wide variety of studies and analyses, many of them based upon computerized simulations, are included. (This updated bibliography contains 147 citations, 15 of which are new entries to the previous edition.)

15G. Operations, Strategy, and Tactics

AD-A118 476/1 PC **A07**/MF **A01**
MITRE Corp., Bedford, MA.
JAMPS Data Table Maintenance Manual.
Technical rept.,
W. J. Kealy, and K. L. Pigott. Apr 82, 142p MTR-8426, ESD-TR-82-125
Contract F19628-81-C-0001

The JINTACCS (Joint Interoperability of Tactical Command and Control Systems) Automated Message Preparation System (JAMPS) uses extensive data tables to store the authorized JINTACCS message structures and data elements. This document describes the various data tables and provides instructions on how to add, change, and delete information as the JINTACCS message change. (Author)

AD-A118 675/8 PC **A03**/MF **A01**
Naval Surface Weapons Center, Silver Spring, MD.
The Combat-System/Ship-System Interface,
F. B. Fassnacht. 1 Feb 82, 29p NSWC/MP-82-78, SBI-AD-F500 055
Presented at a TTCP sponsored Symposium on Ship Combat Systems Survivability Criteria held at Portsdown (England) 2-5 Nov 81.

This report describes some of the work being done by the Combat Systems Department of the Naval Surface Weapons Center in the area of combat-system/ship-system design integration. (Author)

AD-A118 702/0 PC **A02**/MF **A01**
Center for Naval Analyses, Alexandria, VA. Naval Studies Group.
Why the Short-War Scenario is Wrong for Naval Planning.
Professional paper,
John V. Hall. Jul 82, 16p Rept no. CNA-PP-354
Contract N00014-76-C-0001

Is it sensible to plan U.S. naval forces for a short war with the USSR. This paper argues that the answer is a firm, clear 'no.' The discussion focuses on conflict duration. If a war occurred in Europe, then no matter what course the war followed, the United States could expect to find itself involved in a long struggle in which general-purpose naval forces would be vital. The major possibilities seem to be: (1) Avoidance of nuclear war coupled with continued NATO resistance, leading to a long conventional war; (2) Avoidance of nuclear war and collapse of European resistance, leading to a world in which the United States would have to pursue its interests without European allies; and (3) Escalation to nuclear war, followed by a long and dangerous period of reconstitution during which naval forces could be essential to the survival of the United States as a nation. In each case, there would be time to generate national power. But the standing forces (and planned residual forces) should include essential items that otherwise might require years to produce. The main issue in this case is: does the USSR have a strategy to dominate Europe and continue its expansion by means other than direct attack. And if so, does Soviet strategy involve 'diplomacy of force.' We may hope the answer to at least one of these questions is 'no.' But the evidence does not point that way.

AD-A118 758/2 PC **A11**/MF **A01**
National Defense Univ., Washington, DC.
US Army Special Warfare. Its Origins: Psychological and Unconventional Warfare, 1941-1952,
Alfred H. Paddock, Jr. 1982, 229p

Contents: Psychological Warfare in World War II; Unconventional Warfare in World War II; The Interwar Years, Part I: Psychological Warfare; The Interwar Years, Part II: Unconventional Warfare; Korea and the Office of the Chief of Psychological Warfare; The Road to Fort Bragg; The Psychological Warfare Center and the Origins of Special Warfare.

AD-A118 830/9 PC **A04**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
The Effect of Ultra on the World War II North African Campaign.
Study project,
Arthur T. Carey. May 82, 62p

The North African campaign was the US Army's entry into the European ground war. One of the assets the senior Allied leaders had was a British secret known as Ultra - the ability to read Germany's highest level radio transmissions. It is one thing to steal enemy information; it is another matter to make use of the information. A study of how the Allies made use of Ultra information at seven key points during the Campaign showed that, on the whole, very good use was made of the information. There were also errors. Between the good use and the poor use of Ultra, excellent lessons for future commanders in similar situations were displayed. The first lesson is that decrypts of this nature provide accurate RAW information that must be properly analyzed and compared with other sources. Second: Ultra information can give capabilities and probabilities but not intentions. Again analysis is the key. The last major lesson is that the best of intelligence is no substitute for good command strategy and tactics. (Author)

AD-A118 852/3 PC **A07**/MF **A01**
Army War Coll., Carlisle Barracks, PA.
Operational Alternatives for Air Assault Forces in the 1990s.
Study project,
Victor E. Micol, Jr., Dan H. Campbell, and David A. Bramlett. Jun 82, 132p

The focus is on the proper operational alternatives for air assault forces in the 1990s. Operational alternatives are examined in the areas of force packages and packaging, strategic deployment considerations, and tactical employment options. Data were collected

using both offical and unofficial literature and from personal interviews with planners and operators associated with air assault forces and their uses. Emerging Army operational concepts in the new FM100-5 (Final Draft, 15 Jan 82) mandate a reexamination of existing and projected forces and thier proper application consistent with mobile, manuever-oriented offensive notions. Four alternatives in force packaging are examined; the various deployment requirements for air assault forces are measured in terms of strategic airlift sorties, sealift hulls, and combinations of airlift and sealift assets; employment options are evaluated in their historic and current contexts and projected into the 1990s using the parameters of vulnerability and survivability in determining a priority in determining a priority for employment. The study concludes that air assault forces are vital component in the emerging in the operational concepts and that there are preferred courses of action to be pursued in the areas of force packaging, strategic deployment, and tactical employment.

16.
MISSILE TECHNOLOGY

16A. Missile Launching and Ground Support

AD-A118 728/5 PC **A03**/MF **A01**
White Sands Missile Range, NM.
A Modified Newton Method for Multilateration and Its Application to the RMS/MTTS System.
Technical rept.,
William S. Agee, and Robert H. Turner. Aug 82, 43p Rept no. WSMR-TR-81

A globally convergent, modified Newton method is developed for the least squares estimation of target from a DME type range measuring system. The resulting algorithm is used to evaluate the effects of truncation error on the accuracy of the position estimates for the RMS/MTTS system located at MacGregor Range.

PB82-261801 PC **A05**/MF **A01**
National Committee on Tunneling Technology, Washington, DC.
Design and Construction of Deep Underground Basing Facilities for Strategic Missiles. Volume 1. Evaluation of Technical Issues.
Final rept.
Apr 82, 85p NRC/CETS/TT-82-1
See also Volume 2, PB82-261819. Sponsored in part by Defense Nuclear Agency, Washington, DC. Prepared in cooperation with Boeing Co., Seattle, WA.

Volume 1 concerns the technical issues involved in basing missiles deep underground, in particular an assessment of the current and developing tunneling technology that would be important in designing, constructing, and egressing from, deep basing facilities. The Committee and Working Groups did not address the political and strategic issues. Following public briefings, the six Working Groups met in closed, separate sessions to consider the topics on which the Defense Nuclear Agency had asked for guidance: siting; use of existing underground space; egress; mechanical mining; construction planning; and management, contracting, costing, and personnel. On the basis of the findings of the Working Groups (see Chapters 3-8), the Committee developed its general and summary conclusions (see Chapter 2). It was agreed that layout, scheduling, machine performance, and site selection would have substantial impacts.

PB82-261819 PC **A08**/MF **A01**
National Committee on Tunneling Technology, Washington, DC.
Design and Construction of Deep Underground Basing Facilities for Strategic Missiles. Volume 2. Briefings on System Concepts and Requirements.
Final rept.
Apr 82, 152p NRC/CETS/TT-82-2
See also Volume 1, PB82-261801. Sponsored in part by Defense Nuclear Agency, Washington, DC. Prepared in cooperation with Boeing Co., Seattle, WA.

Volume 2 contains the transcripts of briefings by representatives of the U.S. Air Force, Defense Nuclear Agency, and several contractors that have performed conceptual and design work on aspects of the deep basing problem. The briefings, arranged for by DNA as background for the Committee and Working Groups, outlined the relevant issues of nuclear weapons effects, the strategic incentives for deep basing, the system requirements, and various deep basing concepts.

17.
NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A118 470/4 PC **A06**/MF **A01**
Tracor Applied Sciences, Austin, TX.
Hybrid Tracking Algorithm Improvements and Cluster Analysis Methods.
Final rept. 1 Jan 81-26 Feb 82,
Don Cooper, Glenn Corser, and Thomas Wilson. 26 Feb 82, 104p Rept no. TRACOR-T82-AU-9054-U
Contract N00014-78-C-0670

This report details three areas of research undertaken during the past contractual year. First, detailed explanations are provided concerning the modifications made to Tracor's Hybrid Tracking Algorithm (HTA) to improve its overall tracking performance. Second, a summary is provided of Tracor's preliminary investigation into the use of cluster analysis techniques to sort data in the multi-target tracking problem. Finally, a description is provided of an experimental design technique known as response surface methodology. (Author)

PAT-APPL-6-325 419 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Method for Making Radially Compliant Line Array Hose.
Patent Application,
John J. Reading, and Robert O. Hauptmann. Filed 27 Nov 81, 12p AD-D009 643/8
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A radially compliant acoustic line array hose with improved toughness and wear resistance, suitable for use in towed acoustical line array sonars. The hose comprises a long extruded cylindrical tubing of a soft flexible grade of geophysical plasticized polyvinyl chloride material with longitudinal ribs of a stiffer, harder grade of geophysical plasticized polyvinyl chloride material located at or near the tubing surface, and spaced uniformly around the circumference of the tubing. The ribs are melt-bonded to the softer thermoplastic material while each is in their respective melt stages during the extrusion process. (Author)

PATENT-4 328 569 Not available NTIS
Department of the Navy, Washington, DC.
Array Shading for a Broadband Constant Directivity Transducer.
Patent,
W. James Trott, and Jacek Jarzynski. Filed 14 Nov 79, patented 4 May 82, 6p AD-D009 624/8, PAT-APPL-6-094 269
Supersedes PAT-APPL-6-094 269, AD-D007 088.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A broadband directional transducer which provides a beam pattern that is essentially constant for all frequencies above a certain cutoff frequency, an acoustic pressure angular distribution that is virtually independent of the distance from the transducer and no side lobes, includes an array of isophase, omnidirectional electroacoustic elements on a spherical shell, each element being amplitude-shaded according to the shading function.

PATENT-4 333 169 Not available NTIS
Department of the Navy, Washington, DC.
Flow Noise Suppression System for a Sonar Dome.
Patent,
Jack W. Hoyt. Filed 4 Oct 66, patented 1 Jun 82, 5p AD-D009 620/6, PAT-APPL-585 218
Supersedes PAT-APPL-585 218-66.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Apparatus for suppression of water flow noises in connection with a keel mounted sonar dome. A solution of water soluble polymer is ejected through a series of holes along the leading edge of the sonar some under forward movement of the ship. The concentration and flow rate is chosen to 'bathe' the dome in a very dilute dispersion (of the order of 10 parts per million by weight) of the poly mer. (Author)

PB82-264383 Not available NTIS
National Bureau of Standards, Washington, DC.
Precondensation Phenomena in Acoustic Measurements.
Final rept.,
James B. Mehl, and Michael R. Moldover. 1 Jul 82, 11p
Pub. in Jnl. of Chemical Physics, n1 p455-465, 1 Jul 82.

Theoretical and experimental studies of the behavior of acoustic resonators whose walls are coated with a film of condensed vapor are reported. As a sound wave is reflected from the resonator walls, further condensation and evaporation will alter the thickness of the condensed film during the course of an acoustic cycle. The authors demonstrate that the same inhomogeneous precondensation phenomena can be easily be seen in propane at ambient temperature. These precondensation phenomena will influence measurements of acoustic virials at low temperatures, as well as the behavior of certain acoustic thermometers. Measurements of acoustic dissipative processes are also strongly affected. We have observed an increase of reflection losses by more than a factor of 200 as the pressure of propane on an aluminum surface was increased from 90% to 99.5% of the saturated vapor pressure.

17B. Communication

AD-A118 478/7 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
Dynamic Control of Session Input Rates in Communication Networks.
Technical rept.,
Eli Gafni, and Dimitri P. Bertsekas. Aug 82, 8p Rept no. LIDS-P-1228
Contract N00014-75-C-1183
Pub. in Proceedings of MILCOM '82, p1-5 Oct 82, Boston, MA.

No abstract available.

AD-A118 561/0 PC **A02**/MF **A01**
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
Advanced Communication System Studies.
Final rept. 15 May 80-14 May 82,
R. A. Scholtz, W. C. Lindsey, G. Papavassilopoulos, and J. Silvester. May 82, 19p AFOSR-TR-82-0637
Grant AFOSR-80-0171

This report summarizes the work conducted under the grant. The goals of this research were to develop performance models of multi-hop broadcast networks and then utilize these models to suggest optimal routing and control parameters. The authors decided to concentrate their initial effort on the Slotted Aloha access protocol and the generalize to other protocols later. More details can be found in the papers referenced in this report. (Author)

AD-A118 739/2 PC **A03**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
Data Transmitters and Command Receiver Development.
Final scientific rept.,
Hans Laping. 22 Dec 81, 46p Rept nos. AFGL-TR-82-0002, AFGL-IP-307

This report describes the development of a frequency-modulated VHF data transmitter, an HF frequency-shift keying low data rate transmitter and a dual-frequency HF command receiver. These units were designed for high altitude balloon control and data systems. An antenna for the data transmitter and a detector for FSK were also designed. (Author)

AD-A118 780/6 PC **A06**/MF **A01**
Marine Corps Tactical Systems Support Activity, Camp Pendleton, CA.
Digital Communications Terminal High Order Programming Language Study (DCT HOL Study). Volume I.
Final rept.,
K. C. Shumate, R. E. Sauer, G. E. Anderson, J. W. Hooper, and B. F. Brady. 26 Nov 80, 101p Rept no. 24E005/U-TN-01-VOL-1

This paper reports the results of a study to select a high order programming language for the development of computer programs for the digital communications terminal. All languages suitable for use with the NSC800 microprocessor were considered. The nine final candidates were evaluated by a methodology including benchmarking and determination of a figure of merit. During the conduct of the study it became clear that the program support environment must include both a minicomputer software engineering host, and a microcomputer development system. The language selected is Interactive Systems 'C.' The system includes a cross-compiler running on a PDP-11 and generating code for the NSC800. (Author)

AD-A118 784/8 PC **A05**/MF **A01**
Assistant Secretary of Defense (Communications, Command, Control and Intelligence), Washington, DC.
Modernization of the WWMCCS Information System (WIS). Executive Summary and Main Report.
Final rept.
31 Jul 82, 89p
See also AD-A095 409.

This document reports on the status of and describes the approach to the modernization of the WWMCCS Information System (WIS) by the recently-established WIS Joint Programs Manager. The report was prepared for the Committee on Armed Services, United States House of Representatives. The WIS encompasses the information collection, processing, and display system that includes WWMCCS ADP and related software systems, procedures and supporting telecommunications. The current WWMCCS ADP is rapidly approaching obsolesence. Modernization of the hardware and much of the WWMCCS software will be required to meet operational needs. This report addresses the requirements, system structure, acquisition approach, program management, and cost and schedule for the WIS modernization. (Author)

DE82014697 PC **A02**/MF **A01**
Granzow Communications, Washington, DC.
SOUNDS ENERGETIC. Final Technical Report.
S. Granzow. 14 Aug 81, 7p DOE/IR/11125-T2
Contract FG03-80IR11125

The objective of the project was to motivate radio producers to encourage and establish energy-related programming in ten radio markets in Maryland, Virginia, West Virginia, Pennsylvania, Delaware, District of Columbia, and New Jersey. Implementation of the project involved supplying radio stations with energy information kits, specifically a Radio Broadcaster's Energy Kit. The project was expanded beyond the ten original stations. Reports on the interest shown by the stations to broadcast the information furnished them, the public's reaction to the information broadcast, and workshops conducted for broadcasters are included.

N82-29510/6 PC **A11**/MF **A01**
Charles Stark Draper Lab., Inc., Cambridge, MA.
System Data Communication Structures for Active-Control Transport Aircraft, Volume 1.
Final Report.
A. L. Hopkins, J. H. Martin, L. D. Brock, D. G. Jansson, and S. Serben. Jun 81, 236p NASA-CR-165773-V-1, NAS 1.26:165773-V-1
Contract NAS1-15359

Candidate data communication techniques are identified, including dedicated links, local buses, broadcast buses, multiplex buses, and mesh networks. The design methodology for mesh networks is then discussed, including network topology and node architecture. Several concepts of power distribution are reviewed, including current limiting and mesh networks for power. The technology issues of packaging, transmission media, and lightning are addressed, and, finally, the analysis tools developed to aid in the communication design process are described. There are special tools to analyze the reliability and connectivity of networks and more general reliability analysis tools for all types of systems.

N82-29511/4 PC **A08**/MF **A01**
Charles Stark Draper Lab., Inc., Cambridge, MA.
System Data Communication Structures for Active-Control Transport Aircraft, Volume 2.
Final Report.
A. L. Hopkins, J. H. Martin, L. D. Brock, D. G. Jansson, and S. Serben. Jun 81, 156p NASA-CR-165773-V-2, NAS 1.26:165773-V-2
Contract NAS1-15359

The application of communication structures to advanced transport aircraft are addressed. First, a set of avionic functional requirements is established, and a baseline set of avionics equipment is defined that will meet the requirements. Three alternative configurations for this equipment are then identified that represent the evolution toward more dispersed systems. Candidate communication structures are proposed for each system configuration, and these are compared using trade off analyses; these analyses emphasize reliability but also address complexity. Multiplex buses are recognized as the likely near term choice with mesh networks being desirable for advanced, highly dispersed systems.

N82-30237/3 PC **A10**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
The Telecommunications and Data Acquisition Report.
N. A. Renzetti. 15 Jun 82, 212p NASA-CR-169195, JPL-TDA-PR-42-69
Sponsored by NASA.

No abstract available.

PAT-APPL-6-369 200 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Interference Cancelling System.
Patent Application,
Frank S. Gutleber. Filed 23 Jan 80, 11p AD-D009 655/2
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

The described system utilizes a pair of antenna beam patterns, one of which is adapted to provide the desired signal and all interfering signals, and the other of which is adapted to provide only the interfering signals. The patterns are then combined to produce substantially only the desired signal as the combined output. This application is a continuation of application Serial Number 114,547, filed 23 January 1980, which is a continuation of application Serial Number 970,017 filed 18 December 1978, both of Frank S. Gutleber entitled 'Interference Cancelling System.' The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor. (Author)

PAT-APPL-6-387 581 PC **A04**/MF **A01**
Department of the Air Force, Washington, DC.
Interactive Communication Channel.
Patent Application,
Robert H. Chan. Filed 11 Jun 82, 60p AD-D009 646/1
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

An interactive communications channel (ICC) for providing a digital computer with high-performance multichannel interfaces. Sixteen full duplex channels can be serviced in the ICC with the sequence or scan pattern being programmable and dependent upon the number of channels and their speed. A channel buffer system is used for line interface, and character exchange. The channel buffer system is on a byte basis. The ICC performs frame start and frame end functions, bit stripping and bit stuffing. Data is stored in a memory in block format (256 bytes maximum) by a program control and the ICC maintains byte address information and a block byte count. Data exchange with a memory is made by cycle steals. Error detection is also provided for using a cyclic redundancy check technique. (Author)

PATENT-4 330 689 Not available NTIS
Department of the Navy, Washington, DC.
Multirate Digital Voice Communication Processor.
Patent,
George S. Kang, Lawrence J. Fransen, and Evans L. Kline. Filed 28 Jan 80, patented 18 May 82, 11p AD-D009 665/1, PAT-APPL-6-115 860
Supersedes PAT-APPL-6-115 860, AD-D007 141.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

To provide alternative operation at 2.4 or 9.6 Kb/s bit rates, a multirate digital processor generates a data frame of 216 bits representing sync and voice encoded at both rates, with the 2.4 Kb/s embedded as a subset within the frame. Speech signal is transformed by linear prediction into coefficients and residual signals. The coefficients are transmitted similarly at both 2.4 and 9.6 Kb/s rates. However, the residual is processed into a simple pitch/hiss excitation signal for 2.4 Kb/s, but is processed into a Fourier transform of its baseband (250-1500 Hz) for 9.6Kb/s excitation signal transmission.

PATENT-4 330 855 Not available NTIS
Department of the Navy, Washington, DC.
Apparatus for Multiplexing Digital Signals.
Patent,
John T. Redfern, and Gary A. Dressel. Filed 3 Mar 80, patented 18 May 82, 14p AD-D009 627/1, PAT-APPL-6-126 588
Supersedes PAT-APPL-6-126 588, AD-D007 458.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The invention is an apparatus and method for multiplexing digital information acquired from a multiplicity of data terminals distributed along a conductor fo given length. A cyclic synchronization signal consisting of a stream of coding periods is transmitted upon the conductor. The duration of each coding period exceeds the two way travel time through the conductor. The leading edge of a coding period stimulates the transmission of one bit of a digital word stored in each terminal. The bits from the terminals arrive at a system receiver in a time sequence corresponding to the spatial distribution of the terminals. Bits are collected in storage registers according to their significance which is determined by the respective coding period during which they are received. A word from a particular terminal is derived by strobing the output of the storage

registers at the time corresponding to the position of the terminal.

PB82-253295 CP **T03**
Federal Communications Commission, Washington, DC. Data Automation Div.
Common Carrier Individual Land Mobile Data Base.
Data file,
James McCormick, and Lewis Young, Jr. Jul 82, mag tape FCC/DF-82/017
Supersedes PB80-226087.
Source tape is in EBCDIC character set and certain fields contain packed decimal data. Character set restricts preparation in 9 track one-half inch tape only. Identify recording mode desired by specifying density only. Call NTIS Computer Products if you have questions.

The Common Carrier Individual Land Mobile Data Base contains information on all Individual Land Mobile subscibers that are currently licensed. Data base records contain information for: Existing licensees; Licensees marked for deletion; and Transmitter data. The call sign is the major data base identifer.

PB82-254806 CP **T99**
Federal Communications Commission, Washington, DC. Computer Applications Div.
Amateur Radio Service Master File.
Data file,
Bill Bushman. 16 Aug 82, mag tape FCC/DF-82/018
Supersedes PB82-191578.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

These tapes contain data for licensees operating under the Amateur Radio Service, and the primary information is obtained form FCC Form 610 'Application for Individual Amateur Radio Station and/or Operator Licen License' and FCC Form 610B, 'Application for Amateur Club or Military Recreation Station License.' Data records include station and license identification. Mailing address (all items do not contain Zip code), radio frequency, issue and expiration dates, and various codes. The Amateur Radio Service data base is recorded in EBCDIC CHARC. SET on 1600BPI, 9 track, odd parity tape. The data is recorded in Honeywell System Standard Format. All data blocks are 300 characters in length. The data base contains approximately 400,000 records of data characters.

PB82-259367 PC **A09**/MF **A01**
Denver Univ., CO.
Demand for Pay Television and Its Impact on Expansion of Cable Availability.
Final rept.,
Harry Bloch, and Michael Wirth. Jun 82, 183p NSF/SES-82001
Contract NSF-DAR79-24423

Results are presented of a study in which the demand function for per-channel pay cable services was estimated cross-sectionally using multivariate techniques. The theory underlying the demand for television programming when cable television is available to consumers is discussed. The mathematics of the demand model used in the analysis are detailed along with variable definitions and regression estimates of pay cable demand. Ways to simulate cable system profitability by making sure of the provided regression estimates and Federal Communications Commission-provided average cost and basic revenue data are considered. The implications of the demand results for the future of cable television are addressed and the need for further research into the economics of cable television is cited.

PB82-261116 PC **A04**/MF **A01**
Institution of Electronics and Telecommunications Engineers, New Delhi (India).
Journal of the Institution of Electronics and Telecommunication Engineers, Volume 28, Number 5, May 1982.
May 82, 67p
See also PB82-119165.Color illustrations reproduced in black and white.

This document contains the papers presented at the symposium on Space Electronics & Communications. The topics covered are: Space Communication; Commercial Satellite Telecommunication System and its Relevance to India; Satellite Communication Experiments in the Country; Range instrumentation Facilities for Satellite Launch Vehicle; Multi-spectral Microwave observation of earth by 'SAMIR' onboard 'BHASKARA II'; Control and Monitor System for the Ooty Synthesis Radio Telescope; and Modern Trends in Color TV Receiver Technology; Experimental Earth Image Using Linear Photodiode Array in Rohini-DI Satellite.

PB82-262155 PC **A04**/MF **A01**
Deutsche Bundespost, Darmstadt (Germany, F.R.). Fernmeldetechnisches Zentralamt.
Applications of Periodic Integrated Optical Structures in Communication Circuits,
R. Zengerle. Aug 82, 65p REPT-465-TBR-20
Trans. of mono. Einsatzmoglichkeiten Periodischer Integriert Optischer Strukturen in Nachrichtentechnischen Schaltungen, n.p., Jan 80. See also N81-32019.

The application of periodic structures as integrated optical or micro-optical circuits in signal transmission and signal processing is reviewed critically. Difficulties of implementation are also indicated. Narrow-band optical emitters, modulators and switches, multiplex structures, and filters are discussed. Multiplex structures used for better utilization of transmission capacity of fibers and filters are discussed. Multiplex structures used for better utilization of transmission capacity of fibers and filters are found especially attractive. The coupling between fibers and integrated optical structures by means of transversal, horizontal or grid coupling is treated. In view of the complexity of the technology an economical application is thought to be possible only if mass production can be achieved.

PB82-262916 PC **A03**/MF **A01**
National Telecommunications and Information Administration, Boulder, CO. Inst. for Telecommunication Sciences.
Fading Signals in the MF Band,
A. E. Spaulding. Jun 82, 43p NTIA/REPORT-82-102

In the MF band, interfering signals from one or more broadcast stations can be received. During nighttime periods, this interference is caused by fading signals, propagated from distances of more than about 200 miles. It is the purpose of this report to provide the techniques needed to properly determine the degree of interference from one or more distant broadcasting stations. Computer algorithms are developed which determine the actual overall fading distribution of one or a combination of two fading signals, when the short-term fading of each is represented by a Rayleigh distribution and the long-term fading of median values is given by a log-normal distribution. Also, a simple approximate means of determining the distribution of the median value of a signal given by the sum of any number of fading signals is given. This approximate method is accurate only for the smaller percentage points. It is found that the techniques described here lead to somewhat higher values for the sum of the signals than previous methods.

PB82-266131 CP **T08**
Federal Communications Commission, Washington, DC. Computer Applications Div.
Frequency Master File (800 Mh Subset).
Data file,
John Giuli, and M. P. Rinn. 1982, mag tape FCC/DF-82/020
Source tape is in BCD character set. Character set restricts preparation to 9 track, one-half inch tape only. Identify recording mode by specifying density only. Call NTIS Computer Products if you have questions.

This tape is a resource for all licensees in the 800 MHz (806-866 MHz) band. It contains records of the same format as the entire Master Frequency (Non-Government tapes). Services include all Industrial, Public Safety, Land Transportation Personal Radio (General Mobile only) and SMR systems. Major data elements include service, licensee, licensee mailing address, transmitter state, transmitter city, Latitude, Longitude, Frequency, Station class, emission, power and antenna height where available. Product available only as of 8-23-82--one time production.

PB82-876145 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Demodulators. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 355p
Supersedes PB81-851289.

This bibliography contains citations concerning design and applications of demodulators. Applications include digital communications, telephone signals, television signals, mobile radio, long-haul radio, and other situations with weak signals or noisy background. Some citations reflect older work for which the distribution limitation is now removed. (This updated bibliography contains 307 citations, 107 of which are new entries to the previous edition.)

17D. Electromagnetic and Acoustic Countermeasures

AD-A118 554/5 PC **A08**/MF **A01**
Stanford Univ., CA. Information Systems Lab.
Research on Adaptive Antenna Techniques. IV.
Final rept.,
B. Widrow, T. Saxe, K. Duvall, W. Newman, and R. Gooch. 6 Aug 80, 154p
Contract N00019-79-C-0331
See also AD-A068 660.

Adaptive antennas have been under development in various forms during the past two decades or so. Although adaptive antennas have only been used in small numbers thus far, they have proven themselves capable of rejecting jamming signals to an extent that is unprecedented. Most high performance radar and communications systems being designed to work in jamming environments currently incorporate adaptive antennas. The development of spread spectrum techniques simultaneously with adaptive antennas provides a formidable set of technologies for jam resistant systems. These technologies are compatible and are frequently used in the same system. An adaptive antenna is relied upon to attenuate strong jamming signals as they appear at the receiver 'front end.' Spread spectrum techniques are used to neutralize large numbers of weak jammers that may not be eliminated totally by the adaptive antenna.

AD-A118 585/9 PC **A04**/MF **A01**
Army Materiel Development and Readiness Command, Adelphi, MD. Countermeasures/Counter-Countermeasures Office.
Frequency Hopping, Multiple Frequency-Shift Keying, Coding, and Optimal Partial-Band Jamming.
Technical rept.,
Don J. Torrieri. Aug 82, 53p Rept no. CM/CCM-82-1
Contract MIPR-N62269/82/MP/00918

The performance of frequency-hopping systems with multiple frequency-shift keying is determined for operation against optimal partial-band jamming. The effects of Reed-Solomon, binary block, convolutional, and concatenated codes are analyzed. Continuous-phase frequency-shift keying with limiter-discriminato demodulation is shown to offer potentially improved performance in frequency-hopping systems. (Author)

AD-A118 802/8 PC **A03**/MF **A01**
Stanford Univ., CA. Information Systems Lab.
Research on Adaptive Antenna Techniques IV.
Final rept.,
B. Widrow, K. Duvall, R. Gooch, and W. Newman. Aug 81, 43p
Contract N00019-80-C-0483
See also report dated 6 Aug 80, AD-A118 554.

This paper is concerned with jamming signals that can potentially defeat or partially defeat know adaptive antenna algorithms. The existence of jammers capable of troubling known adaptive arrays motivates us to develop new adaptive signal processing and array processing algorithms two of which are proposed herein. The goals of this paper are three: (a) to examine signal cancellation phenomena in adaptive beamformers, (b)to formulate approaches toward the elimination of adaptive signal cancellation phenomena, and (c) to introduce spatial dither algorithms to combat signal cancellation and break up smart jammer signals at the receiving array.

PATENT-4 328 496 Not available NTIS
Department of the Navy, Washington, DC.

Delay Control for a Pulse Repeat-Back Jamming System.
Patent,
Charles F. White. Filed 27 Aug 58, patented 4 May 82, 7p AD-D009 662/8, PAT-APPL-757 644
Supersedes PAT-APPL-757 644-58.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

In a repeat-back jammer of the type used to deceive range tracking radar systems, wherein tracking is accomplished by a gate at the input of said radar system and a servo system which adjusts the relative time position of the input gate to coincide with echo pulses returning from a distant target, and wherein said jammer includes a repeat-back amplifier which transmits a jamming pulse for each said echo pulse the initial jamming pulse being so delayed with respect to said echo pulse that only a minor portion of said jamming pulse coincides with said input gate, said jamming pulse being of sufficient amplitude that said minor portion obscures the echo pulse, the improvement which comprises; time delay means to increase said initial dealy of said jamming pulse with respect to said echo pulse in response to a control signal, wave generating means to supply a control signal for said time delay means and a multiplier means for multiplying said signal by 1 - microns(o)beta(o) interconnecting said time delay means and said wave generating means, wherein microns(o)beta(o) is the open loop transfer function of said servo system. (Author)

17G. Navigation and Guidance

AD-B062 856/0 PC **A02**/MF **A01**
Admiralty Compass Observatory, Slough (England).
A Cryogenic Nuclear Magnetic Resonance Gyroscope,
Susan P. Potts, and John Preston. 1980, 14p DRIC-BR-74875
Pub. in J.N.S., v6 n3 p188-200 1980.
Distribution limitation now removed.

The exploitation of the principle of nuclear magnetic resonance as a basis for measuring rotation is described. A simple introduction to certain aspects of the phenomenon of superconductivity, requiring the provision of temperatures close to the absolute zero, is followed by discussion of the advantages to be gained by the use of superconducting magnetic shields and highly sensitive instruments known as SQUIDS (Superconducting Quantum Interference Devices). Preliminary ideas are presented for the development of an inertial navigation system based on the effects described. A comprehensive list of references emphasizes the breadth of a topic on which the present article provides but a general survey.

PAT-APPL-6-300 451 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Temperature Controlled Gyro.
Patent Application,
John M. Kennel. Filed 20 May 82, 16p AD-D009 639/6
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A method of, and apparatus for, eliminating the error-causing heat convections of a liquid which is disposed between a warm cylindrical float that houses a navigational gyro and a cool cylindrical gyro case that houses the float. The method includes the performances of steps which result in raising the temperature of the gyro case to the temperature of the float. The apparatus includes a temperature controller assembly which further includes temperature sensitive resistors to ascertain the temperatures respectively, of the float and of the gyro; a differential amplifier to ascertain the difference in the temperatures; and a heater coil surrounding the gyro case to heat the case to the higher temperature of the float. (Author)

17H. Optical Detection

AD-A118 491/0 PC **A04**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Man Vehicle Lab.
Masking Effects on Visual Target Detection and Tracking.
Final research rept.,
Yehoshua Y. Zeevi, T. M. Longridge, and J. C. De Maio. May 82, 56p AFOSR-TR-82-0625
Grant AFOSR-81-0135

Since eye movements are required for the detection and tracking of a point target, their concomitant signal can provide physiological objective measures of performance in target acquisition tasks. Saccadic latency, misses, and false alarm rate were used in assessing and comparing the effects of static and dynamic masks on target detection and tracking. A point target with an effective diameter of 0.4 degrees was displayed in either of two fixed positions separated by 18 degrees symmetrically with respect to the egocentric axis. Timing of target displacement was either periodic, or aperiodic. The masking field was generated by projection of a polarized texture pattern, characterized by a spectrum below 1 cpd, superimposed on the visual axis via a beam splitter. Masking dynamics were generated by a rotating polarizer situated in front of the masking field projector. As target luminance decreased from 11 to 6 ft-L, reaction time measured as saccadic latency, increased. This effect of target luminance was further substantiated once static masking was introduced. Aperiodic target displacements resulted in false alarm saccades to the right position. It was found that dynamic mask of the same spatial spectrum and contrast had a significantly more detrimental effect on subject performance.

PAT-APPL-6-382 068 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Reduction of Signal Modulation Caused by Polarization in Visible Optical Scanning Systems.
Patent Application,
Matthew R. Comer. Filed 26 May 82, 16p AD-D009 635/4
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A method of, and apparatus for, minimizing the polarization modulation effect of an optical scanner system which is in earth orbit and is scanning the earth, where the optical train of the scanner includes a plurality of optically aligned, rotatable, flat folding mirrors having incident angle normals in the same plane, with the mirrors serially reflecting an image acquired by the scanning of the system in orbit. The method includes the steps of rotating the most rearwardly disposed of the mirrors around its vertical geometric axis such that the reflecting surface of the mirror is perpendicular to the impinging image beam, and then rotating the mirror around its horizontal geometric axis such that the angle of incidence of the impinging image beam is of a preselected magnitude. This change in positional relationship results in a novel apparatus which minimize the aforesaid polarization modulation effect. (Author)

PB82-875972 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Remote Viewing Equipment. June, 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for Jun 76-Sep 82.
Sep 82, 234p
Supersedes PB81-855033.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning the design, development, and applications of remote viewing equipment. The equipment is used to inspect or view work areas that preclude human presence. Usually these areas are exceptionally small, such as boreholes and the interior of steam pipes, or are hazardous, such as radiation environment. The citations cover sensors, manipulation, and viewing devices. Many of the applications pertain to the nuclear power industry, for reactors, fuel rods or security alarms. (This updated bibliography contains 243 citations, 66 of which are new entries to the previous edition.)

17I. Radar Detection

AD-A118 572/7 PC **A03**/MF **A01**
Michigan State Univ., East Lansing. Div. of Engineering Research.
Radar Waveform Synthesis for Target Identification.
Final rept. 11 May 81-10 May 82,
Kun-Mu Chen. 3 Jun 82, 38p
Contract N00019-81-C-0321
See also AD-A103 805.

A new scheme for radar detection and discrimination, the radar waveform synthesis method, is investigated. This scheme consists of synthesizing the aspect-independent, incident radar signal which excites the target in such a way that the return radar signal contains only a single natural mode of the target in the late-time period. When the synthesized incident signal for a preselected target is applied to a wrong target, the return signal will be significantly different from the expected natural mode, thus, the wrong target can be discriminated. At alternative scheme is also developed to extract the single-mode return signal by convolving, using a computer, the required incident radar signal for the single-mode excitation with a return radar signal from the target excited by an arbitrary incident radar signal. A study on the synthesis of the K-pulse has been initiated. The progress on the experimental setup and study is reported. (Author)

AD-A118 763/2 PC **A07**/MF **A01**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
A Fiber Optic Beam Controller for Phased Array Radars.
Final technical rept. 10 Dec 80-9 Feb 82,
R. B. Efurd, E. O. Rausch, M. A. Corbin, and B. E. Huitt. Jun 82, 136p GIT/EES-A-2832, RADC-TR-82-173
Contract F19628-81-C-0026

The objective of the research documented in this report was to determine if the accurate time delay and the broad bandwidth of fiber optics could be exploited to construct a time delay phasing device for a microwave antenna. Time delay phasing of microwave antennas is highly desirable because there is no coupling between the signal bandwidth and the antenna beam angle for a time delay antenna. This enables radiation of broad bandwidth signals necessary for close range resolution at precise angles from a phased array mirowave antenna.

N82-29509/8 PC **A04**/MF **A01**
Axiomatix, Los Angeles, CA.
Ranging/Tracking System for Proximity Operations.
Final Report.
P. Nilsen, and S. Udalov. 3 Jun 82, 65p NASA-CR-167636, NAS 1.26:167636
Contract NAS9-15666

The hardware development and testing phase of a hand held radar for the ranging and tracking for Shuttle proximity operations are considered. The radar is to measure range to a 3 sigma accuracy of 1 m (3.28 ft) to a maximum range of 1850 m (6000 ft) and velocity to a 3 sigma accuracy of 0.03 m/s (0.1 ft/s). Size and weight are similar to hand held radars, frequently seen in use by motorcycle police officers. Meeting these goals for a target in free space was very difficult to obtain in the testing program; however, at a range of approximately 700 m, the 3 sigma range error was found to be 0.96 m. It is felt that much of this error is due to clutter in the test environment. As an example of the velocity accuracy, at a range of 450 m, a 3 sigma velocity error of 0.02 m/s was measured. The principles of the radar and recommended changes to its design are given. Analyses performed in support of the design process, the actual circuit diagrams, and the software listing are included.

N82-29513/0 PC **A06**/MF **A01**
Illinois Univ. at Urbana-Champaign. Aeronomy Lab.

A Preprocessor for the Urbana Coherent-Scatter Radar.
F. T. Zendt, and S. A. Bowhill. 1 Mar 82, 120p
NASA-CR-169200, NAS 1.26:169200
Grant NSG-7506, Contract NSF ATM-78-21765

The design, interfacing, testing, and operation of a preprocessor to increase the altitude and temporal resolution of the present coherent-scatter system are described. This system upgrade requires an increase in the data collection rate. Replacing the present, relatively slow, ADC with two high speed ADCs achieves the increased echo sampling rate desired. To stay within the capabilities of the main computer's I/O and processing rate the data must be reduced before transfer to the main computer. Thus the preprocessor also coherently integrates the data before transfer.

PAT-APPL-6-377 108 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
P2 Polyphase Code Expander-Compressor.
Patent Application,
Frank F. Kretschmer. Filed 11 May 82, 18p AD-D009 649/5
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Document describes a pulse expansion and compression system, especially useful for radar ranging, comprising a pulse coder for expanding an input pulse and a pulse compressor of the matched-filter type. The coder consists of a plurality of delay stages into which the input pulse is fed, a discrete Fourier transform (DFT) circuit to which the output signals of the delay stages are fed by way of respective phase weights and for which every frequency port is phase-shifted prior to entry to a time-dispersion-means (TDM) comprising an arrangement of delay stages for differently delaying the output signals from the DFT. The TDM putput is fed to a phase modulator and then to the transmitter. The echo signals are conjugated, time-inverted, and passed through the same DFT as the input pulse signal by way of the phase weights. The outputs of the DFT are then phase-shifted at every frequency port and passed through the TDM, but this time in time-inverted order. The outputs of the TDM are fed through an envelope detector to provide a cross-correlated facsimile of the original input pulse. (Author)

PAT-APPL-6-382 069 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Three-Stage Binary Coincidence Detector Apparatus with Adaptive Constant False Alarm Rate.
Patent Application,
Jimmie J. Justus. Filed 26 May 82, 12p AD-D009 634/7
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A target processor utilizing a feedback loop to maintain a constant false alarm rate for variable level video input signals with noise or noise plus clutter on the input signal. The processor includes three serially connected stages of binary coincidence detectors which comprise a threshold detector for processing video signals which exceed a threshold level, an M of N detector for providing an alarm for each range gate having a count of M or greater pulses, and a P of Q detector for generating a target alarm after at least P or greater frequencies have been transmitted. (Author)

PAT-APPL-6-382 070 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Laminated Thermoplastic Radome.
Patent Application,
Edward E. Greene. Filed 26 May 82, 23p AD-D009 637/0
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This invention relates generally to radomes, and, in particular to radomes attached to supersonic aircraft. Of particular concern is the ability of these radomes to have a greater field life in hostile rain impact environments. As rain impacts on a radome moving at high speeds, the radome can be degraded within a short time. An improved rain resistance radome C-sandwich wall is constructed of thermoplastic polycarbonate material. The cores are either posts or tubes and are bonded to the skins with polyurethane. The percentage of core material to air is adjusted by electrical tuning to make the optimum dielectric value for use in the gigahertz radar frequency range.

18.
NUCLEAR SCIENCE AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

DE82011555 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
First-Wall Fusion-Blanket Heat Transfer.
J. A. Fillo. 1980, 6p BNL-30806, CONF-8009240-1
Contract AC02-76CH00016
International heat transfer conference, Munich, F.R. Germany, 15 Sep 1980, Portions of document are illegible.

To accommodate the high heat flux and neutron and gamma heat generation in the first wall of a fusion reactor, an array of tubes or tube-bank forms a first wall shield of the blanket. A series solution to the two-dimensional (in r,theta coordinates), time-dependent heat conduction equation has been found in terms of Fourier-Bessel (modified Bessel) functions. Steady-state solutions are found as limiting solutions. The heat sources are pulsed on and off to simulate the plasma burn and cool down periods. In addition to the Biot numbers, the time-dependent solution is given in terms of the Fourier, Pomerantsev, and Kirpichev numbers and numerically evaluated for a wide range of plasma and first wall conditions. Comparison of the thermal responses of the first wall between aluminum, a high thermal conductivity material and stainless steel, a low thermal conductivity material, is made.

DE82012470 MF **A01**
Brookhaven National Lab., Upton, NY.
Neutral-Beam System Based on BNL Negative-Hydrogen-Ion Sources.
K. Prelec. 1982, 6p BNL-31069, CONF-820345-9
Contract AC02-76CH00016
Symposium on heating in toroidal plasmas, Grenoble, France, 22 Mar 1982, Portions of document are illegible.
Available in microfiche only.

Parameters of the conceptual design of the BNL neutral beam system were determined as follows: beam energy, 200 keV; negative ion current, 10A; neutral beam power, 1 MW; pulse length, multisecond to steady state. The completed system study, supported by successful ion source operation at the required level, will serve to evaluate and compare different approaches in the design of a negative ion based system and, eventually, lead to the design and construction of an operational system.

DE82013569 PC **A09**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Damage Analysis and Fundamental Studies.
Feb 82, 182p DOE/ER-0046/8-V.2, CONF-790391-
Contract AC06-76FF02170
US DOE workshop on techniques for radiation damage analysis, Oakbrook, IL, USA, 8 Mar 1979, Portions of document are illegible.
Microfiche only after original copies are exhausted.

Separate abstracts were prepared for each of the 10 included sections. (ERA citation 07:045318)

DE82013867 PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Final Report, Intramural Orders 2435809 (1978-1979) and 6407609 (1979-1980).
J. DeGroot. 31 Jan 81, 28p UCRL-15456
Contract W-7405-ENG-48

Research progress is reported for each of the following topics: (1) stimulated brillouin scattering and filamentation, (2) absorption and self-focusing of a focused beam, (3) microwave absorption, electron heating, and electron heat transport, (4) theory and computation of electron heat transport, and (5) macroparticle acceleration.

DE82013937 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Irradiations at RTNS-II.
D. W. Heikkinen, and C. M. Logan. 1982, 9p UCRL-86747, CONF-820406-2
Contract W-7405-ENG-48
Topical meeting on fast, thermal and fusion reactor experiments, Salt Lake City, UT, USA, 12 Apr 1982, Portions of document are illegible.

The RTNS-II 14-MeV neutron source facility at Lawrence Livermore National Laboratory is described. Average neutron source parameters are outlined. A brief general description of the irradiation program to the present time is given. A short discussion of guidelines for prospective users is also given.

DE82014002 PC **A02**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Use of Microhardness to Determine the Strengthening and Microstructural Alterations of 14-MeV-Neutron-Irradiated Metals.
N. F. Panayotou. Feb 82, 18p HEDL-SA-2529, CONF-811145-11
Contract AC06-76FF02170
International conference on neutron irradiation effects, Argonne, IL, USA, 9 Nov 1981.

Microhardness has been found to be an effective post-irradiation analytical tool. The hardening of recrystallized copper and type 316 stainless steel irradiated up to 1 x 10 exp 18 n/cm exp 2 , E = 14 MeV, at the Rotating Target Neutron Source (RTNS)-II has been studied. It was determined that for these metals the increase in hardness varies directly with the measured increase in the 0.2 percent offset yield strength. Furthermore the coupled use of microhardness and transmission electron microscope techniques provides an estimate of the defect population which was not resolved by TEM. This estimate in turn, was used to evaluate the magnitude of the proportionality constant used in the strong barrier model of radiation induced hardening.

DE82014089 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Temperature Dependence of Electron-Bombardment-Enhanced Reactivity of Different Types of Graphite.
C. I. H. Ashby. 1982, 19p SAND-82-0055C, CONF-820545-5
Contract AC04-76DP00789
International conference on plasma surface, Gatlinburg, TN, USA, 3 May 1982.

Methane yield enhancements due to simultaneous electron bombardment of graphite reacting with atomic hydrogen have been studied in the temperature range 300 to 820 exp 0 K for incident electron energies from 40 to 210 eV. From 300 to 600 exp 0 K, relatively small changes in yield enhancements are observed as temperature is varied, with values of the order of 10 exp -3 to 10 exp -2 CH sub 4 /electron observed. Above 600 exp 0 K, methane yield enhancements are greater (10 exp -2 to 10 exp -1 CH sub 4 /electron) and increase with temperature up to the highest temperature studied, 820 exp 0 K. Both thermal reaction rates and electron yield enhancements are strongly dependent on the reaction history of the sample, with significantly higher values for fresh surfaces than for reacted surfaces. Overestimation of wall erosion is possible if rates derived from fresh samples are used for calculating long term erosion. C sub 2 -hydrocarbon production increases relative to CH sub 4 production as temperature increases and is also enhanced by electron bombardment. Papyex and POCO graphites exhibit similar behavior, while oriented pyrolytic graphite exhibits some differences.

DE82014392 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Plasma Fusion Center.

Suppression of Plasma Formation in Waveguide Antennas for Lower-Hybrid Heating.
S. F. Knowlton, M. Porkolab, and S. C. Luckhardt.
Apr 82, 8p DOE/ET/51013-42, PFC/CP-82-6, CONF--820345--12
Contract AC02-78ET51013
Symposium on heating in toroidal plasmas, Grenoble, France, 22 Mar 1982.
Microfiche only after original copies are exhausted.

A magnetic field has been applied to the 800 MHz four-waveguide lower-hybrid heating grill on the Versator II tokamak to suppress plasma formation and RF breakdown in the evacuated waveguides during tokamak operation. Without an auxiliary magnetic field, the incident power density is limited typically to 0.13 kW/cm exp 2 . When the imposed magnetic field in the antenna is above the electron-cyclotron resonance value, the grill operates without RF breakdown or plasma formation at an incident power level of 0.42 kW/cm exp 2 , limited only by the available RF power. A power density of 0.94 kW/cm exp 2 has been achieved when all the RF power was injected into one waveguide, again with no evidence of plasma formation. (ERA citation 07:045252)

DE82014565 MF **A01**
KMS Fusion, Inc., Ann Arbor, MI.
Laser Fusion Experiments at KMS.
E. K. Storm. 13 Apr 82, 19p KMSF-U-1204, CONF-820554-1
Contract AC08-82DP40152
US/Japan seminar on theory and application of multiple ionized plasmas produced by laser and particle beams, Osaka, Japan, 3 May 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

As part of the US Inertial Confinement Fusion program and under the direction of the Lead Laboratory, the KMSF laser fusion effort has been focused on three primary experimental areas during the past year and a half. Long scale length laser plasma interaction physics was studied in the gas-jet experiments, a classified target campaign was conducted to investigate the physics of radiation driven targets, and we began spherical target irradiation experiments with the all reflective Triple Bounce Illumination System (TBIS). In addition, a few secondary experimental campaigns were conducted, in particular on gold disks and low density plastic foam. During the period covered by this paper, some 600 target shots were done in two different target chambers using the 20 cm diameter two beam Chroma laser at 1.05 and 0.53 mu m. The routine operating level of Chroma is summarized.

DE82014956 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Summary of Thomson-Scattering Data from the Tandem Mirror Experiment (TMX).
R. K. Goodman. 11 Jan 82, 25p UCRL-53243
Contract W-7405-ENG-48

We provide a synthesis of our Thomson-scattering measurements of electron temperature (T/sub e/) and density (n/sub e/) for the Tandem Mirror Experiment (TMX). TMX operated in two modes - high and low T/sub e/. When performing in the high T/sub e/ mode (in general > 100 eV), heating the central-cell ions with neutral beams raised T/sub e/ in the end plug. We achieved a maximum T/sub e/ of 260 eV in the east end plug. Specifically, our experiments demonstrated that in the end plug, the radial T/sub e/ profiles were flat to r = 5 cm; the ratio of potential (phi/sub p/) to T/sub e/ ranged between four and six. In addition, we found that although T/sub e/ in the central cell was generally comparable to that in the plug, it was often not constant along a magnetic field line. Under some conditions a non-Maxwellian electron distribution may have been present.

DE82015073 PC **A03**/MF **A01**
Los Alamos National Lab., NM.
Switching Tests for the LCTF Protective Dump Circuit.
W. M. Parsons. Apr 82, 42p LA-9261-MS
Contract W-7405-ENG-36
Microfiche only after original copies are exhausted.

Each of the six coils in the Large Coil Test Facility (LCTF) has a separate power supply, dump resistor, and switching circuit. Each switching circuit contains five switches, two of which are redundant. The three remaining switches perform separate duties in an emergency dump situation. These three switches were tested to determine their ability to meet the LCTF conditions.

DE82015235 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Calibration of a Diamagnetic Diagnostic for Stored Energy of High-Temperature Electron Annuli in Elmo Bumpy Torus (EBT).
K. H. Carpenter, R. A. Dandl, and M. W. McGuffin.
May 82, 45p ORNL/TM-7076
Contract W-7405-ENG-26
Microfiche only after original copies are exhausted.

The perpendicular energy component of the stored energy of the electron annuli in ELMO Bumpy Torus (EBT) can be observed with diamagnetic flux detecting coils. The calibration of the signal from the coils in terms of stored energy requires a model for the geometrical structure of the annulus. Using a model of concentric cylindrical current sheets, the calibration factor for the diamagnetic perpendicular energy signal is derived, including the effects of drift currents and coupling of flux from adjacent annuli. Numerical calculations show the calibration factor to be insensitive to reasonable variations in the model parameters.

DE82016037 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Design of the Target Fabrication Tritium Laboratory.
J. W. Sherohman, D. H. Roberts, and B. H. Levine. 5 May 82, 22p UCID-19372
Contract W-7405-ENG-48
Microfiche only after original copies are exhausted.

The design of the Target Fabrication Tritium Laboratory for deuterium-tritium fuel processing for laser fusion targets has been accomplished with the intent of providing redundant safeguard systems. The design of the tritium laboratory is based on a combination of tritium handling techniques that are currently used by experienced laboratories. A description of the laboratory in terms of its interrelated processing systems is presented to provide an understanding of the design features for safe operation. (ERA citation 07:045373)

DE82016042 PC **A05**/MF **A01**
Oak Ridge National Lab., TN.
Negative-Ion-Beam Generation with the ORNL SITEX Source.
W. K. Dagenhart, W. L. Stirling, and J. Kim. May 82, 78p ORNL/TM-7895
Contract W-7405-ENG-26
Microfiche only after original copies are exhausted.

Parametric studies were made on a hot cathode reflex discharge H exp - Surface Ionization source with Transverse Extraction (SITEX) in both the pure hydrogen and the mixed hydrogen-cesium mode. Extraction current density, beam current, gas efficiency, extracted electron-to-H exp - current ratio, heavy negative ion impurities, optics, and long pulse operation were investigated as a function of time, arc voltage, arc current, converter voltage, H sub 2 gas flow, cesium feed rate, and plasma generator geometries. Initial results of the research were an extracted H exp - beam current density of 56 mA/cm exp 2 at 23 mA for 5 s pulses and, gas efficiency of 3%, theta/sub perpendicular/ (1/e) approx. 2 +- 1 exp 0 , theta/sub parallel/ (1/e) approx. 1 +- 1 exp 0 , at a beam energy of 25 keV. Negative heavy ion beam impurities were reduced to < 1% at low current densities. H exp - ions are produced prinicpally by positive ion surface conversion using elemental cesium fractional monolayer coverage on a molybdenum converter substrate, which is biased negatively with respect to the anode. (ERA citation 07:045362)

DE82701407 MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).
Multi-Megajoule Heating of Large Tokamaks with High Energy Heavy Ion Beams.
R. Dei-Cas. Jul 81, 8p CEA-CONF-5896, CONF-810620-21
International topical conference on high-power electron and ion-beam research and technology, Palaiseau, France, 29 Jun 1981.
U.S. Sales Only. Available in microfiche only.

The fast neutral injection heating and RF heating for tokamak like plasmas are now well established. We consider in this paper the use of high energy (approximately 1 GeV) heavy ions (Xe exp 132) to reach ignition in JET or INTOR like tokamaks. The main advantages of such a method will be outlined. The capture and the confinement of heavy ions have been analysed in a particular case and with the described RF linac it seems possible to inject in the order of 50 MJ in 1 sec with a modest increase of the effective charge Zsub(eff) < 1.05 in a JET-like plasma for a particle life time of 1 sec and then the additional radiated power should be maintained at a relatively low level in comparison to the injected power. (Atomindex citation 13:660481)

DE82701408 MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).
Slowing down of Heavy Ions in a Ionized Metal Target. Relevance to the Heavy Ion Inertial Fusion and Experimental Study Proposal.
R. Dei-Cas. Jul 81, 8p CEA-CONF-5897, CONF-810620-22
International topical conference on high-power electron and ion-beam research and technology, Palaiseau, France, 29 Jun 1981.
U.S. Sales Only. Available in microfiche only.

By using a simplified model we have analysed the influence of the main target (Tsub(e), n, Zsub(p)) and incoming ion parameters (Zsub(f), Esub(f)) on the heavy ion ranges and on the energy deposition profiles. The model is an extension of the one used in the neutral beam heating in a tokamak like plasma; although the plasma parameter ranges are very different for magnetic fusion and inertial confinement it is generally thought that the slowing down should be classical. In the paper we will identify some of the main uncertainties in the slowing down processes and to study these processes we propose an experimental set up consisting of a heavy ion probe crossing a laser created plasma target. The output energy of the heavy ion probe appears to be a sensitive parameter of the plasma characteristics. (Atomindex citation 13:660482)

DE82701409 MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France).
Slowing down of Heavy Ions in Ionized Target. Relevance to the Heavy Ion Inertial Fusion and Experimental Study Proposal.
R. Dei-Cas. Jul 81, 53p CEA-R-5119
In French.
U.S. Sales Only. Available in microfiche only.

By using a simplified model we have analyzed the influence of the main target (Tsub(e), n, Zsub(p)) and incoming ion parameters (Zsub(f), Esub(f)) on the heavy ion slowing down in ionized metal targets. This model is used to define an experimental set up consisting of a heavy ion probe crossing a laser created plasma target. The energy output of the heavy ion probe appears to be a sensitive parameter of the target characteristics. (Atomindex citation 13:660483)

DE82701410 MF **A01**
Association Euratom-CEA, Centre d'Etudes Nucleaires de Grenoble (France). Dept. de Recherche sur la Fusion Controlee.
Progress Report, Part 3 - Grenoble (From January to December 1980).
1981, 131p EUR-CEA-FC-1101(Pt.3)
In French.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This progress report deals with the following topics: 1) theoretical works, 2) plasma produced by electron cyclotron-resonance, 3) Petula Tokamak, 4) Wega experiment, 5) instrumentation (antennas, electro-optic diagnostics for Petula, lower-hybrid heating of plasma jet). (Atomindex citation 13:660484)

DE82701414 MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Simulating Thermal Loadings on Electrodes of Ion-Optical Systems of a Stationary Ion Source.
A. A. Panasenkov, V. I. Romanov, and V. S. Seregin. 1981, 17p IAE-3375/7
In Russian.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Calculation and experimental study of forced cooling of electrode connectors of the ion-optic system (IOS) of powerful stationary ion sources intended for injectors of thermo-nuclear devices, is carried out. Hydraulic characteristics of profiled electrode connectors are measured and heat stressed regimes of their operation by heating with the electric current are modelled. Calculations and experiments show that IOS connectors of the configuration described remain operable at uniform density currents of up to 600 Wt/cm exp 2 . Water velocity in tubes should be 23.5 m/s which corresponds to tube pressure difference of 9.2x10 exp 5 Pa. It is shown experimentally that the design of water feeding pipes to connector collectors significantly affects pressure losses in IOS electrodes. The decrease in the amount of abrupt rotations in the feeding pipe design decreases these losses considerably. (Atomindex citation 13:660492)

DE82701569 MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
PALLAS-TS: A One-Dimensional Neutron Transport Code for Analyzing Fusion Blanket Neutronics.
T. Suzuki, Y. Ishiguro, and Y. Matsui. May 81, 32p
JAERI-M-9492
In Japanese.
U.S. Sales Only. Available in microfiche only.

The one-dimensional neutron transport code PALLAS-TS has been developed for solving the transport equation by direct numerical integration method. Group-transference kernels are accurately obtained from the double-differential cross section data using the energy and scattering angle correlation relation for elastic and inelastic (discrete levels) scattering. In addition, a usual multigroup model is adopted in calculation of spatial and angular flux distribution so as to make it possible to use iteration technique with neutron rebalancing in each group. This code uses a 120-group data library for 29 nuclides prepared temporarily by processing the ENDF/B-IV file, though the nuclear data file available now is incomplete for accounting fully the anisotropy of scattering. Results of test calculation for a 4-region system consisting of lithium and carbon were compared with the P sub 5 -S sub 8 calculations by the ANISN code. The present code is the first trial of incorporating the multigroup to the direct integration method for solving the transport equation. It is observed that computing time by this code is shorter than that of the usual S sub(n) method by a factor of 2 or 3. (Atomindex citation 13:662279)

DE82750179 PC **A02**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Theoretical Scaling Law for Ohmically Heated Tokamaks.
E. Minardi. Jun 81, 22p IPP-1/183
U.S. Sales Only.

The electrostatic drift instability arising from the reduction of shear damping, due to toroidal effects, is assumed to be the basic source of the anomalous electron transport in tokamaks. The Maxwellian population of electrons constitutes a medium whose adiabatic nonlinear reaction to the instability (described in terms of an effective dielectric constant of the medium) determines the stationary electrostatic fluctuation level in marginally unstable situations. The existence of a random electrostatic potenial implies a fluctuating current of the Maxwellian electrons which creates a random magnetic field and a stocasticization of a magnetic configuration. The application of recent results allows the calculation of the realted radial electron transport. It is found that the confinement time under stationary ohmic conditions scales as n Tsub(i)sup(exp - 1/2) and is proportional roughly to the cube of the geometric dimensions. Moreover, it is deduced that the loop voltage is approximateley the same for all tokamaks, irrespective of temperature and density and to a large extent, also of geometrical conditions. Thes results are characteristic of the ohmic stationary regime and can hardly be extrapolated to order heating regimes. (ERA citation 07:045341)

DE82750184 PC **A02**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Two-Dimensional Modelling of the ZEPHYR Experiment.
S. C. Jardin, D. B. Albert, and W. Schneider. Feb 81, 17p IPP-1/184
U.S. Sales Only.

A two-dimensional transport code, based on a description due to Hirshman and Jardin, has been used to model a typical discharge for the ZEPHYR experiment. We describe here the equations solved by this code and present the results of this calculation. (ERA citation 07:045269)

DE82750282 PC **A03**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Parametric Analyses of Fusion-Fission Systems.
J. Raeder. May 81, 42p IPP-4/199
U.S. Sales Only.

After a short review of the nuclear reactions relevant to fusion-fission systems the various types of blankets and characteristic model cases are presented. The fusion-fission system is modelled by its energy flow diagram. The system components and the system as a whole are characterized by 'component parameters' and 'system parameters' all of which are energy ratios. A cost estimate is given for the net energy delivered by the system, and a collection of formulas for the various energies flowing in the system in terms of the thermal energy delivered by the fusion part is presented. For sensitivity analysis four reference cases are defined which combine two plasma confinement schemes (mirror and tokamak) with two fissile fuel cycles (thorium-uranium and uranium-plutonium). The sensitivity of the critical plasma energy multiplication, of the circulating energy fraction, and of the energy cost with respect to changes of the component parameters is analysed. For the mirror case only superconducting magnets are considered, whereas two tokimak cases take into account both superconducting and normal-conducting coils. A section presenting relations between the plasma energy multiplication and the confinement parameter n tausub(E) of driven tokamak plasmas is added for reference. The conclusions summarize the results which could be obtained within the framework of energy balances, cost estimates and their parametric sensitivities. This is supplemented by listing those issues which lie beyond this scope but have to be taken into account when assessments of fusion-fission systems are made. (ERA citation 07:045342)

DE82750283 PC **A03**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Choice of Parameters for the Lower Hybrid Heating Experiment for ASDEX.
F. Leuterer. Jun 81, 46p IPP-4/202
U.S. Sales Only.

The design criteria are described which lead to the choice of frequency and wave-number spectra for the lower hybrid heating experiment be applied on ASDEX. (ERA citation 07:045278)

DE82750286 PC **A02**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Tokamak - an Imperfect Frame of Reference.
K. U. Schmitter. Mar 81, 21p IPP-4/201, CONF-810364-44
International school of fusion reactor technology's course on unconventional approaches to fusion, Erice, Italy, 16 Mar 1981.
U.S. Sales Only.

It is attempted to assess the suitability of tokamaks for fusion power plants on the basis of existing design studies by reference to the reality of energy production in fission power plants. A definition of suitability criteria and a discussion of their relation to the most important features of power plants are followed by a comparative treatment. For example, the mean volumetric net electric power density in the nuclear islands of tokamak power plant designs is only 2,5 to 4 E of the value common today in light water reactor nuclear islands. In addition, configuration problems, auxiliary power requirements and energy payback time are discussed and taken into account in the assessment. (ERA citation 07:045343)

DE82903004 PC **A03**/MF **A01**
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy).
Tokamak Concept and Its Physics.
H. Knoepfel. 1980, 35p CONF-8006232-2
Courses on engineering aspects of thermonuclear fusion reactors, Ispra, Italy, 23 Jun 1980.
U.S. Sales Only.

The tokamak represents the most studied and best known magnetic confinement configuration in today's fusion research. Its toroidal geometry and the basic concepts of the related plasma physics are presented and discussed in this paper with particular reference to confinement properties required to obtain plasmas of thermonuclear interest. (ERA citation 07:048794)

DE82903006 PC **A03**/MF **A01**
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy).
NET Experimental Reactor.
R. Toschi. 1980, 34p CONF-8006232-3
Courses on engineering aspects of thermonuclear fusion reactors, Ispra, Italy, 23 Jun 1980.
U.S. Sales Only.

A main goal in the European fusion program during the Nineties should be the full demonstration of the scientific feasibility of fusion via magnetic confinement and the demonstration of the viability of the basic technologies required in a thermonuclear reactor. A central role in this program should be played by the Next European Tokamak (NET). NET would possibly represent the only intermediate step between JET and DEMO and it could be defined as a reliable D-T burning Tokamak capable of reaching a burn pulse of 200 s and to test reactor relevant blanket concept to be installed in DEMO. A vigorous scientific and technological supporting program has to be conducted during the Eighties in order to be able to construct NET during the early Nineties. The objectives, the main guidelines of the project with some of the main features of the design and the R and D needed to ensure a sound basis for the design are described. (ERA citation 07:048795)

DE82903036 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy).
Frascati Tokamak.
Jan 81, 34p NP-2903036
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

The Frascati Tokamak (FT) has been designed to extend ohmic heating and confinement studies to a wide range of plasma current, toroidal magnetic field and electron density. Due to the high toroidal field, plasma currents of the same order as those produced in the largest tokamaks now operating (like PLT or T-10) can be sustained in a relatively small size (R = 83 cm, a = 20 cm). The main aims of FT are: (1) the investigation of density limits; (2) scaling of energy confinement; and (3) rf heating at high plasma density regimes. (ERA citation 07:045351)

DE82903037 PC **A03**/MF **A01**
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy).
Proposal for FTU: the Frascati Tokamak Upgrade.
Jan 81, 33p NP-2903037
U.S. Sales Only.

Design guidelines for the Upgrade are given for the toroidal magnet, poloidal field circuits, vacuum vessel and ports, and the rf heating system. (ERA citation 07:045352)

DE82903056 PC **A03**/MF **A01**
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy).
Diffusive Model for alpha -Particle Energy Transport in a Laser Plasma.
S. Atzeni, and A. Caruso. Dec 80, 31p NP-2903056
U.S. Sales Only.

The ignition of a laser-fusion pellet is essential due to the energy that the alpha -particles yielded by the D-T reactions in a small inner hot spot transfer to the outer cold and dense plasma. It is shown that if the plasma temperature is less than or equal to 30 keV the problem of alpha particle energy transport reduces, in good approximation, to the solution of a single equation for the kinetic energy density of the alpha -particles. This method is favorably compared with other models and is included in a 1-D Lagrangian code. (ERA citation 07:045354)

DE82903190 PC **A11**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.

Review of the Prospects for Fusion Breeding of Fissile Material.
J. S. Geiger, and G. A. Bartholomew. Oct 81, 232p
AECL-7259
U.S. Sales Only.

This report is the result of an eight month study by the AECL Fusion Status Study Group. The objectives of this study were to review the current status of fusion research, to evaluate the neutronic performance of various fusion-breeder systems, and to assess the economic and technological outlook for the fusion breeder as a source of fissile material to support CANDU reactors operating on the thorium fuel cycle. (ERA citation 07:048782)

N82-30083/1 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Is Magnetic Compression Effective in Burning Tokamak Experiments.
K. Yamazaki. Mar 82, 15p IPPJ-566

Adiabatic compression heating is effective as far as Alcator energy confinement scaling is fulfilled, but not effective for recent PDX and ISX-B global loss scalings. Other merits of magnetic compression, especially the possibility of velocity-space thermonuclear instabilities, are discussed for burning plasma experiments.

N82-30089/8 PC **A05**/MF **A01**
Australian Inst. of Nuclear Science and Engineering, Lucas Heights.
Parametric Amplification of Alfven Waves.
G. A. Collins. 1981, 81p INIS-MF-6424
Presented at the 13TH Ainse Plasma Phys. Conf., Lucas Heights, Australia, 9 Feb. 1981.

Wave research in progress is concerned with the structure of transverse MHD shock waves and the parametric amplification of Alfven waves. However, the main effort is directed toward the construction of the TORTUS Tokamak which will be used for Alfven wave studies in high temperature plasmas.

N82-30096/3 PC **A01**
Japan Atomic Energy Research Inst., Tokyo. Div. of Thermonuclear Fusion Research.
Computational Studies of Tokamak Plasmas.
T. Takizuka, T. Tsunematsu, S. Tokuda, M. Azumi, and G. I. Kurita. Feb 81, 80p DE82-700129, JAERI-M-9354
In English; Japanese Summary.

Computational studies of Tokamak plasmas are extensively advanced. Many computational codes were developed by using several kinds of models, i.e., the finite element formulation of MHD equations, the time dependent multidimensional fluid model, and the particle model with the Monte-Carlo method. These codes are applied to the analyses of the equilibrium of an axisymmetric toroidal plasma (SELENE), the time evolution of the high-beta Tokamak plasma (APOLLO), the low-n MHD stability (ERATO-J) and high-n ballooning mode stability (BOREAS) in the INTOR Tokamak, the nonlinear MHD stability, such as the positional instability (AEOLUS-P), resistive internal mode (AEOLUS-I) etc., and the divertor functions.

N82-30097/1 PC **A03**/MF **A01**
Japan Atomic Energy Research Inst., Tokyo. Div. of Thermonuclear Fusion Research.
One-Dimensional Transport Code for the Simulation of D-T Burning Tokamak Plasma: Poise I.
T. Tone, K. Maki, M. Kasai, and H. Nishida. Nov 80, 122p DE82-700470, JAERI-M-9167
In Japanese; English Summary.

A one dimensional transport code for D-T burning Tokamak plasma was developed, which simulates the spatial behavior of fuel ions (D, T), alpha particles, impurities, temperatures of ions and electrons, plasma current, neutrals, heating of alpha and injected beam particles. The basic transport equations are represented by one generalized equation so that the improvement of models and the addition of new equations may be easily made. A model of burn control using a variable toroidal field ripple is employed.

18B. Isotopes

DE82014684 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Stable Isotope Customer List and Summary of Shipments - FY 1981.
W. C. Davis. May 82, 31p ORNL/TM-8302
Contract W-7405-ENG-26
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This compilation is published as an aid to those concerned with the separation and sale of stable isotopes. The information is divided into four sections: alphabetical list of domestic and foreign customers, showing the stable isotopes purchased during the fiscal year; alphabetical list of isotopes, cross-referenced to customer numbers and divided into domestic and foreign categories; alphabetical list of states and countries, cross-referenced to customer numbers and divided into domestic and foreign categories; alphabetical list of states and countries, cross-referenced to customer numbers and indicating geographical concentrations of isotope users; and tabulation of the shipments, quantities, and dollars for domestic, foreign, and project categories for each isotope. (ERA citation 07:042669)

DE82015498 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Beneficial Uses of Nuclear Waste/Sewage Sludge Irradiation Project. Progress Report, April 1981-September 1981.
May 82, 75p SAND-82-0069
Contract AC04-76DP00789
Microfiche only after original copies are exhausted.

The objective is the further development and transfer of sludge irradiation technology to the municipal sector. At the conclusion of this project, a number of sludge irradiation demonstration plants will have been constructed and placed in operation by municipalities across the country. The following program elements have been established to ensure successful accomplishment of the program objectives: technology transfer by means of municipal demonstration plants; research support and data base development through operation of the SIDSS (Sandia Irradiator for Dried Sewage Solids) pilot plant; engineering support for the demonstration plants by SNL and LANL to include required support for NEPA/licensing activities, risk assessment, safety, and basic design engineering support to A and E firms; life sciences and agricultural R and D support by NMSU for base program activities and for demonstration plants; quality assurance activities to support licensing and other requirements; and program management. During the period covered by this report, the objectives of the BU/SSIP project have been expanded to include determination of an appropriate role for DOE and SNL in food irradiation. Progress on the program elements for the period April 1, 1981 through September 30, 1981, is discussed in detail. (ERA citation 07:047297)

PB82-265687 Not available NTIS
National Bureau of Standards, Washington, DC.
CO2 Laser Coincidences with nu(3) of SiF4 Near 9.7 Micrometer.
Final rept.,
Robin S. McDowell, Chris W. Patterson, Norris G. Nereson, F. R. Petersen, and J. S. Wells. Sep 81, 5p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Optics Letters 6, n9 p422-424 Sep 81.

Doppler-limited tunable-diode-laser spectra of the stretching fundamental (nu sub 3) of (28)SiF4 at 1031/cm have been analyzed and the spectroscopic constants determined. Explicit identifications have been made for transitions near CO2 laser lines of the 9.4 micrometer band; eight such transitions have been observed in sub-Doppler saturation spectra obtained with a waveguide CO2 laser. Implications for isotope enrichment experiments are discussed.

18C. Nuclear Explosions

AD-A118 680/8 PC **A07**/MF **A01**
JRB Associates, Inc., McLean, VA.
Shots WHEELER to MORGAN, The Final Eight Tests of the PLUMBBOB Series, 6 September - 7 October 1957.
Final rept.,
Jeannie Massie, and Jean Ponton. 30 Sep 81, 146p DNA-6007F, SBI-AD-E301 020
Contract DNA001-79-C-0473

This report describes the activities of DOD personnel, both military and civilian, in Shots WHEELER to MORGAN, the final eight nuclear tests in the PLUMBBOB atmospheric weapons testing series. The tests were conducted between 6 September and 7 October 1957 and involved participants from Exercise Desert Rock VII and VIII, AFSWP, AFSWC, and various AEC test groups. This volume also describes the radiological safety criteria and procedures in effect at Shots WHEELER to MORGAN.

AD-A118 681/6 PC **A07**/MF **A01**
JRB Associates, Inc., McLean, VA.
Shots BOLTZMANN to WILSON, The First Four Tests of the PLUMBBOB Series, 28 May - 18 June 1957.
Final rept.,
Jaton West, Martha Wilkinson, Carol Simpson, and Jeannie Massie. 28 Sep 81, 144p DNA-6008F, SBI-AD-E301 022
Contract DNA001-79-C-0473

This report describes the activities of DOD personnel, both military and civilian, in Shots BOLTZMANN to WILSON, the first four nuclear tests in the PLUMBBOB Series, which were conducted from 28 May to 18 June 1957. The tests involved participants from Exercise Desert Rock VII and VIII, AFSWP, AFSWC, and various AEC test groups. This volume also describes the radiological safety criteria and procedures in effect at Shots BOLTZMANN to WILSON.

AD-A118 683/2 PC **A10**/MF **A01**
JRB Associates, Inc., McLean, VA.
Shots DIABLO to FRANKLIN PRIME, The Mid-Series Tests of the PLUMBBOB Series, 15 July - 30 August 1957.
Final rept.,
Carl Maag, and Jean Ponton. 29 Sep 81, 202p DNA-6006F, SBI-AD-E301 021
Contract DNA001-79-C-0473

This report describes the activities of DOD personnel, both military and civilian, in the eight mid-series shots of Operation PLUMBBOB, an atmospheric weapons testing series. The tests were conducted from 15 July 1957 through 30 August 1957 and involved participants from Exercise Desert Rock VII and VIII, AFSWP, AFSWC, and various AEC test groups. This volume also describes the radiological safety criteria and procedures in effect at the mid-series PLUMBBOB shots.

AD-A118 684/0 PC **A09**/MF **A01**
JRB Associates, Inc., McLean, VA.
Operation RANGER, Shots ABLE, BAKER, EASY, BAKER-2, FOX, 25 January-6 February 1951.
Final rept.,
Carl Maag, Stephen Rohrer, and Robert Shepanek. 26 Feb 82, 182p DNA-6022F, SBI-AD-E301 023
Contract DNA001-79-C-0473

This report describes the activities of DOD personnel, both military and civilian, in Operation RANGER, the first atmospheric nuclear weapons testing series, conducted in Nevada from 25 January to 6 February 1951. The RANGER series consisted of one high-explosive shot and five nuclear shots: ABLE, BAKER, EASY, BAKER-2, and FOX. DOD activities included scientific and diagnostic experiments, DOD air and land support activities, and radiological safety activities. In addition, radiological safety procedures were established and

implemented to minimize the radiation exposures of test participants.

18D. Nuclear Instrumentation

AD-A118 724/4 PC **A05**/MF **A01**
Panametrics, Inc., Waltham, MA.
Operation of the Rapid Scan Particle Spectrometer SC5 on the SCATHA Satellite.
Final rept. Apr 79-Dec 81,
Frederick A. Hanser, and Bach Sellers. Jun 82, 82p
AFGL-TR-82-0164
Contract F19628-79-C-0099

The SC5 Rapid Scan Particle Spectrometer on the SCATHA satellite was designed to measure electrons and protons from 0.05 to 500 keV. Electrostatic analyzers (ESA's) are used for the 0.05 to 70 KeV range, with 8 energy bins, and solid state spectrometers (SSS's) are used for the higher energy range. Two complete detector sets view in perpendicular and parallel directions to the satellite spin axis, and a complete set of spectra is measured once per second. With a 57 second spin period, the perpendicular detector set provides pitch angle distributions with 6 degrees resolution. The SC5 instrument can also be connected to a broad-band FM channel where the output of any one detector can be viewed with 250 microsecond time resolution. The SCATHA satellite was launched on 30 January 1979, and SC5 was turned on 9 February 1979. Since then it has provided a considerable amount of particle data for an environmental atlas, and much unique data, especially from the high time resolution FM band, for electron and ion gun operations. The complete detector set has operated properly for over a year, well in excess of the design life of six months. The SC5 data analysis procedure is described, and several examples of reduced spectra and pitch angle distributions are given. Some examples of FM data from the electron gun operations are also given.

DE82011556 MF **A01**
Brookhaven National Lab., Upton, NY.
New Survey-Assay Meter for Portable Applications.
M. S. Zucker, and R. L. Chase. 1979, 8p BNL-30811, CONF-790430-17
Contract AC02-76CH00016
Annual symposium on safeguards and nuclear material management, Brussels, Belgium, 25 Apr 1979, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Brookhaven Survey Assay Meter (BSAM) was developed under US Department of Energy Office of Safeguards and Security auspices to fulfill a need in the field of nuclear material safeguards for an instrument having the basic capabilities of the well known Eberline Stabilized Assay Meter (ESAM) but with superior and additional features made possible by more recent technology. The basic design goal was a rugged portable self-contained instrument, able to function with a variety of nuclear radiation detectors under non-ideal environmental conditions, and with automatic features to simplify operation, data reduction, and reduce operator fatigue and error. Since many of these goals are in at least partial conflict with others, compromises had to be made to achieve a viable result. The more significant features of the new instrument will be described and the others mentioned.

DE82014074 MF **A01**
Los Alamos National Lab., NM.
Standard Evaluation Techniques for Containment and Surveillance Radiation Monitors.
P. E. Fehlau. 1982, 8p LA-UR-82-1106, CONF-820415-4
Contract W-7405-ENG-36
Annual symposium on harmonization and standardization, Petten, Netherlands, 27 Apr 1982, Portions of document are illegible.
Available in microfiche only.

Evaluation techniques used at Los Alamos for personnel and vehicle radiation monitors that safeguard nuclear material determine the worst-case sensitivity. An evaluation tests a monitor's lowest sensitivity regions with sources that have minimum emission rates. The result of our performance tests are analyzed as a binomial experiment. The number of trials that are required to verify the monitor's probability of detection is determined by a graph derived from the confidence limits for a binomial distribution. Our testing results are reported in a way that characterizes the monitor yet does not compromise security by revealing its routine performance for detecting process materials.

DE82014435 PC **A05**/MF **A01**
Lawrence Livermore National Lab., CA.
Real-Time Computer Analysis for Nuclear Material Detection. Part 3. Nuclear Instrumentation Interface.
T. B. Gosnell, R. E. Wood, and G. A. Anzelon. Dec 81, 96p UCID-19181
Contract W-7405-ENG-48
Portions of document are illegible.
Microfiche only after original copies are exhausted.

An electronic interface between a Digital Equipment Corporation (DEC) LSI-11 microcomputer and a LeCroy Research Systems model 3001 qVt multichannel analyzer is described in detail. This interface provides for 16-bit parallel data transfer from the memory of the analyzer to the memory of the computer. An unusual feature of the interface is a provision that allows storage of counts of logic pulses (e.g., from radiation detector discriminators) in the first 16 channels of the analyzer's memory. A further provision allows use of a LeCroy printer and display interface that is designed specifically as a companion module to the qVt analyzer.

DE82014727 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Calibration of the Indium Foil Used for Criticality Accident Dosimetry in the UCC-ND Employee Identification Badge.
M. T. Ryan, H. M. Butler, E. D. Gupton, and C. S. Sims. May 82, 20p ORNL/TM-8294
Contract W-7405-ENG-26
Microfiche only after original copies are exhausted.

The UCC-ND Employee Identification Badge contains an indium foil disc that is intended for use as a dosimetry screening device in the event of a criticality accident. While it is recognized that indium is not a precise mixed neutron-gamma dosimeter, its activation by neutrons provides adequate means for separating potentially exposed persons into three groups. These groups are: (1) personnel exposed below annual dose limits, (2) personnel exposed above annual dose limits but below 25 rem, and (3) personnel exposed above 25 rem. This screening procedure is designed to facilitate dosimeter processing in order to meet regulatory reporting requirements. A quick method of interpreting induced activity measurements is presented and discussed. (ERA citation 07:044565)

DE82750128 MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Digital Ratemeter.
D. E. Groening. Mar 81, 22p IPP-3/68
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The problems in measuring pulserates are shown. A comparison is made of the analog ratemeter and the counter connected as a ratemeter and the advantages and disadvantages of both systems are shown. Afterwards the function of a new digital ratemeter for linear and log scale is explained which includes the advantages of both systems. For this kind of ratemeter a patent is applied. (ERA citation 07:044554)

DE82750129 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Pattern Recognition in Layered Track Chambers Using a Tree Algorithm.
D. G. Cassel, and H. Kowalski. Nov 80, 27p DESY-80-107
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

A new approach to the pattern recognition problem in multi-layer track chambers is presented. Tracks are constructed from locally related hits using a tree algorithm. This approach has worked well in quite different track finding problems in the large cylindrical drift chamber in the TASSO detector at PETRA. Its success in analyzing complicated e exp + e exp - jet events indicates that it can be applied to other problems, including the complicated jet topologies expected at higher energy. (ERA citation 07:044535)

DE82750130 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Trigger and Decision Processors.
G. Franke. Nov 80, 12p DESY-80-109, CONF-8009242-1
Europhysics conference on computing in high energy and nuclear physics, Bologna, Italy, 9 Sep 1980.
U.S. Sales Only. Available in microfiche only.

In recent years there have been many attempts in high energy physics to make trigger and decision processes faster and more sophisticated. This became necessary due to a permanent increase of the number of sensitive detector elements in wire chambers and calorimeters, and in fact it was possible because of the fast developments in integrated circuits technique. The present situation will be reviewed. The discussion will be mainly focussed upon event filtering by pure software methods and - rather hardware related - microprogrammable processors as well as random access memory triggers. (ERA citation 07:044536)

DE82750131 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Fast Trigger Techniques.
P. Waloschek. Nov 80, 18p DESY-80-114, CONF-800684-14
International conference on experimentation at LEP, Uppsala, Sweden, 16 Jun 1980.
U.S. Sales Only.

Electronic systems which recognize useful reactions and reject most background within a few microseconds are discussed in connection with their application in electron positron storage ring experiments. (ERA citation 07:044537)

DE82750132 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Characteristics of Lead-Scintillator Sampling Shower Counters for the Detection of Electrons and Photons in the Energy Range 70 MeV to 6 GeV.
W. Hofmann, A. Markees, U. Matthiesen, O. Maediger, and M. Schmelling. Jul 81, 14p DESY-81/045
U.S. Sales Only. Available in microfiche only.

A lead-scintillator shower counter using fluorescent radiation converters to collect scintillation light was tested with electrons and photons in the energy range 70 MeV to 6 GeV. The influence of the various design paramters was investigated. Typical resolutions obtained were sigma approx. equal to 7%/ sqrt E (in GeV) for photon- or electron energies, and sigmasub(x) approx. equal to 11 mm/ sqrt E (in GeV) for the impact position. (ERA citation 07:044538)

DE82750133 MF **A01**
Hahn-Meitner-Inst. fuer Kernforschung Berlin G.m.b.H. (Germany, F.R.). Bereich Datenverarbeitung und Elektronik.
Timing Single Channel Analyzer with Pileup Rejection.
J. Lauch, and H. U. Nachbar. Jul 81, 34p HMI-B-355
In German.
U.S. Sales Only. Available in microfiche only.

A Timing Single Channel Analyzer is described as normally used in nuclear physics applications for measuring certain ranges of energy spectra. The unit accepts unipolar or bipolar gaussian shaped or rectangular pulses and includes a special pileup rejection circuit. Because of its good timing performance high resolution timing and coincidence measurements are possible. The differential analyzer, trigger and timing modes and the function of external strobe and gate signals are explained. Parts of the circuit are illustrated by help of block diagrams and pulse schematics. An essential part of the unit is the pileup rejection circuit. Following theoretical reflections the circuit is described and some measurement results are reported. (ERA citation 07:044545)

DE82750284 MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).

Neutron Flux Measurement System for ASDEX.
G. Assi, and H. Rapp. Mar 81, 61p IPP-III/70
U.S. Sales Only. Available in microfiche only.

A neutron flux mesurement system has been developed for evaluating the ion temperature in the ASDEX tokamak. The system uses exp 10 B or exp 3 He proportional counters for neutron detection. The results of computations and test measurements show the influence of several factors on the error for the ion temperature determination. Test measurements were made in the Wendelstein VII a stellarator, the results being in good agreement with other diagnostics. (ERA citation 07:045280)

DE82902984 PC **A02**/MF **A01**
Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati.
Recoil-Proton Fast-Neutron-Counter Telescope.
G. Galeazzi, P. Pavan, D. Toniolo, G. Zago, and R. Zannoni. 1981, 8p INFN/BE-81/3
U.S. Sales Only.

A proton-recoil neutron counter telescope is described composed of a solid state silicon transmission detector and a NE 102 A plastic scintillator, measuring the energy loss, the energy of the recoil protons and the time-of-flight between the two detectors. The counter exposed to monoenergetic neutron beams of energy from 6 to 20 MeV, presents a low background and a moderate energy resolution. Its absolute efficiency is calculated up to 50 MeV. (ERA citation 07:047880)

DE82903028 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.
Analysis of Characteristics of Ionizing Radiation Detectors Used in Radiation Protection Activities in Nuclear Power Plants.
M. De Blasiis. Sep 81, 45p CNEN-RT/PROT-(81)22
In Italian.Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

This work tries to individualize the characteristics and requisites of ionizing radiation detectors by achieving a standard of their efficiency and reliability. Such standards are held to be indispensable for a better performance of health physics protection in nuclear plants. (ERA citation 07:044532)

PAT-APPL-6-330 427 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Linearization of Sample Geiger-Mueller Radiation Detector.
Patent Application,
H. J. Cooley, and E. Dilanni. Filed 14 Dec 81, 16p AD-D009 656/0
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

In a sample radiation detector including a pulsed Geiger-Mueller detector tube the response to gamma radiation is linearized by providing an additional 'reward' pulse after the second of two adjacent pulses of a pulse train generated from Geiger-Muller pulses outputted from the detector tube during at least two consecutive sampling time periods and wherein the pulse train is thereafter time averaged to provide a measurement signal which is a linear function of the radiation field strength. (Author)

PAT-APPL-6-386 154 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Lightweight Neutron Detector.
Patent Application,
Charles A. Young, Bruce D. Geehood, and Dennis M. Silva. Filed 7 Jun 82, 13p AD-D009 641/2
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A neutron detector is disclosed which uses the moderating material as the structural support for the neutron detector element. A thin metal liner is affixed to the inside of the plastic moderating material encasement for containing a neutron detecting gas. A high voltage supply is connected to an electrical conductor which extends between the ends of the encasement and serves to furnish output pulses to a pulse counter upon the occurrence of ionization of the counting gas in response to neutron flux through the volume of the detector. (Author)

18E. Nuclear Power Plants

AD-A118 807/7 PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Uncertainty in Estimating Power-Plant Closure Costs: A Review of 'Economic Impact of Closing Zion Nuclear Facility,' a Report by the Comptroller General of the United States,
James P. Stucker. Mar 82, 43p Rept no. RAND/P-6736

Comparing GAO's estimates of the costs that could result from the closure of Zion and Indian Point reveals the large range of uncertainty currently associated with such estimates and suggests a number of areas requiring further study. Better and more detailed information on alternative generating costs, decommissioning costs, incremental financing costs, and secondary costs in general needs to be developed and documented. And the groups or institutions who will ultimately bear these costs need to be identified. Uncertainties in all these areas must be reduced, and common costing methods and assumptions adopted, before intelligent decisions can be made regarding the future of any of the nuclear generating facilities (either operational or under construction) that are currently being questioned. (Author)

DE82013273 PC **A04**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Comprehensive Safeguards Evaluation Methods and Societal Risk Analysis.
J. M. Richardson. Mar 82, 58p SAND-82-0366
Contract AC04-76DP00789
Microfiche only after original copies are exhausted.

Essential capabilities of an integrated evaluation methodology for analyzing safeguards systems are discussed. Such a methodology must be conceptually meaningful, technically defensible, discriminating and consistent. A decompostion of safeguards systems by function is mentioned as a possible starting point for methodology development. The application of a societal risk equation to safeguards systems analysis is addressed. Conceptual problems with this approach are discussed. Technical difficulties in applying this equation to safeguards systems are illustrated through the use of confidence intervals, information content, hypothesis testing and ranking and selection procedures.

DE82013760 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Technical Evaluation Report on the Monitoring of Electric Power to the Reactor-Protection System for the Pilgrim Nuclear Power Station.
J. C. Selan. 29 Apr 82, 8p UCID-19134
Contract W-7405-ENG-48

This report documents the technical evaluation of the monitoring of electric power to the reactor protection system (RPS) at the Pilgrim Nuclear Power Station. The evaluation is to determine if the proposed design modification will protect the RPS from abnormal voltage and frequency conditions which could be supplied from the power supplies and will meet certain requirements set forth by the Nuclear Regulatory Commission. The proposed design modifications will protect the RPS from sustained abnormal voltage and frequency conditions from the supplying sources.

DE82013864 MF **A01**
Brookhaven National Lab., Upton, NY.
Analysis of CRBRP Station Blackout Using SSC/MINET.
G. J. Van Tuyle. 1982, 7p BNL-NUREG-31110, CONF-820705-4
Contract AC02-76CH00016
Joint ASME/ANS nuclear engineering conference, Portland, OR, USA, 25 Jul 1982, Portions of document are illegible.
Available in microfiche only.

A steam generator system transient analysis package (MINET), recently incorporated into the SSC code (a nuclear power plant systems analysis code), is reported. Essentially a code within a larger code, MINET is so named because it is based on a momentum integral network method. Since the SSC code is being used extensively in the analysis of the Clinch River Breeder Reactor Plant (CRBRP), an analysis of the CRBRP steam generator system, using MINET, is reported. Plant transient data are generally unavailable for such advanced power plants, therefore, results from computer analysis of a CRBRP station blackout event, using the DEMO code, are shown. Comparable SSC/MINET analysis provided similar results, particularly when two specific DEMO assumptions were factored into the MINET calculations. A more extensive SSC/MINET analysis of a CRBRP station blackout event, with pony motors and auxiliary feedwater pumps unavailable, is also reported. (ERA citation 07:043413)

DE82014520 PC **A06**/MF **A01**
Department of Energy, Washington, DC. Energy Information Administration.
Historical Perspective, Current Status, and Outlook.
B. Roberts, A. Reynolds, and G. Clark. Mar 82, 107p DOE/EIA-0315
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This report presents a historical overview of nuclear power development in the United States, its current status and short-term outlook, and projections through the year 2020. The historical overview covers the history of domestic nuclear power development beginning with the discovery of nuclear fission. The current status and short-term outlook (through 1983) are presented in light of the influence of recent developments (such as the accident at the Three Mile Island nuclear plant) and the impact these developments could have in the short term. The projections for 1985 and later were prepared for the EIA 1981 Annual Report to Congress, Volume 3 (published in February 1982) in two basic time periods. The midterm comprises the 1985, 1990, and 1995 milestone years, and the long term covers the period beyond 1995 to 2020.

DE82750248 PC **A03**/MF **A01**
Gesellschaft fuer Reaktorsicherheit m.b.H., Cologne (Germany, F.R.).
Critical Review of the >>Stellungnahme Zur 'Deutschen Risikostudie' der Gesellschaft fuer Reaktorsicherheit (GRS)<< By the Bremer Arbeits- und Umweltschutz-Zentrum.
H. J. Danzmann. Aug 81, 35p GRS-36
In German.
U.S. Sales Only.

In August 1979, the German Risk Study was presented to the public by the Federal Minister of Research and Technology. The main contractor to prepare the German Risk Study is the Gesellschaft fuer Reaktorsicherheit (GRS). The objective of the Study is to investigate the collective risk involved in accidents at nuclear power plants. The essential results and statements of the Study are comprised in a Summary submitted to the public in August 1979, too. In September 1979, the 'Bremer Arbeits- und Umweltschutz-Zentrum' ('BAUZ') published a 'Stellungnahme zur 'deutschen Risikostudie' der Gesellschaft fuer Reaktorsicherheit (GRS)' (Review of the German Risk Study of the Gesellschaft fuer Reaktorsicherheit), dealing only with the summary of this study, however. The BAUZ review is extremely critical of the German Risk Study and ends in condemning the peaceful utilization of nuclear energy as well as the competent authorities. The GRS review critique in hand scrutinizes the BAUZ paper according to the run of the text. Deliberately, one has renounced a comment in such cases where the reproaches slip in the political or ideological field. The object of the BAUZ review as well as of the GRS critique is the matter to be investigated, aim and methods of the investigations and the results of the German Risk Study. The revision of the review acknowledges that in some cases the tendency of criticism is justified. Often, however, the critique is only a sharpened repetition of what the GRS itself has identified as restrictions of accuracy and inherent significance of the results. In most items, however, the critique is rejected as to be wrong or not proof. (ERA citation 07:043676)

DE82902982 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.

Condition Maintenance of the Components of Nuclear Power Plants.
P. Cesarano. May 81, 32p CNEN-RT/ING-81-11
In Italian.Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

An on condition maintenance (O.C.M.) policy, that applies to nuclear power plant equipment is exposed in this report. It analyzes the structure of the O.C.M. based on preventive maintenance as a consequence of inspections performed on the equipment to check its operation and status. A computational method to determine the optimal inspection timing versus equipment availability is proposed. Finally, handy tables for inspection planning and drafting a maintenance program are presented. (ERA citation 07:046639)

NUREG/CP-0032 PC **A07**/MF **A01**
Brookhaven National Lab., Upton, NY.
Workshop on Meteorological Aspects of Emergency Response Plans for Nuclear Power Plants,
S. SethuRaman, J. Tichler, A. Patrinos, W. F. Dabbert, and F. L. Ludwig. Aug 82, 146p BNL-NUREG-51552
Proceedings of the workshop held at Menlo Park, California, December 1-3, 1981.

The purpose of the workshop was to collect and integrate the comments of the user community on the Nuclear Regulatory Commission's (NRC's) atmospheric dispersion modeling requirements in support of nuclear power plant radiological emergency response plans. The technical sessions provided an overview of the state of the art in health physics; release characteristics; transport, diffusion, and deposition; and operational aspects. The three working groups addressed the themes of health physics and meteorology, release characteristics and meteorology, and dispersion and deposition.

NUREG/CR-2000-V1-N7 PC **A08**/MF **A01**
Oak Ridge National Lab., TN. Nuclear Safety Information Center.
Licensee Event Report (LER) Compilation for Month of July 1982.
Monthly rept.
Aug 82, 152p ORNL/NSIC-200-VOL-1-NO-7
See also NUREG/CR-200-V1-N6.

This monthly report contains Licensee Event Report (LER) operational information that was processed into the LER data file of the Nuclear Safety Information Center (NSIC) during the one month period identified on the cover of this document. The LER summaries in this report are arranged alphabetically by facility name and then chronologically by event date for each facility. Component, system, and keyword indexes follow the summaries.

NUREG/CR-2833-V1 PC **A04**/MF **A01**
Human Factors Society, Inc., Santa Monica, CA.
Critical Human Factors Issues in Nuclear Power Regulation and a Recommended Comprehensive Human Factors Long-Range Plan. Volume 1. Executive Summary.
Final rept.,
Charles O. Hopkins, Harry L. Snyder, H. E. Price, Richard J. Hornick, and Robert R. Mackie. Aug 82, 65p
See also NUREG/CR-2833-V2.

This comprehensive long range human factors plan for nuclear reactor regulation was developed by a Study Group of the Human Factors Society, Inc. This Study Group was selected by the Society to provide a balanced, experienced human factors perspective to the application of human factors scientific and engineering knowledge to nuclear power generation. The report is present in three volumes. This Volume contains the Executive Summary of the 18-month effort and its conclusions.

NUREG/CR-2833-V2 PC **A17**/MF **A01**
Human Factors Society, Inc., Santa Monica, CA.
Critical Human Factors Issues in Nuclear Power Regulation and a Recommended Comprehensive Human Factors Long-Range Plan. Volume 2: Programs Evaluation and Recommended Long-Range Plan.
Charles O. Hopkins, Harry L. Snyder, H. E. Price, Richard J. Hornick, and Robert A. Mackie. Aug 82, 385p
See also NUREG/CR-2833-V1 and NUREG/CR-2833-V3.

Volume 3 of the 3 volume work elaborates upon each of the human factors issues and areas of concern that have lead to recommendations in the long range plan.

NUREG/CR-2833-V3 PC **A13**/MF **A01**
Human Factors Society, Inc., Santa Monica, CA.
Critical Human Factors Issues in Nuclear Power Regulation and a Recommended Comprehensive Human Factors Long-Range Plan. Volume 3: Critical Discussion of Human Factors Areas of Concern,
Charles O. Hopkins, Harry L. Snyder, H. E. Price, Richard J. Hornick, and Robert R. Mackie. Aug 82, 280p
See also NUREG/CR-2833-V2.

Volume 2 of the 3 volume work summarizes all known nuclear human factors activity, evaluating this activity, wherever adequate information is available, and describes the recommended long-range (10-year) plan for human factors in regulation.

NUREG-0485-V4-N7 PC **A05**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Systematic Evaluation Program Status Summary Report, July 31, 1982.
Aug 82, 98p
See also NUREG-0485-V4-N6.

The Systematic Evaluation Program examines many safety-related aspects of 11 of the older light water reactors. This document provides the existing status of the review process including individual topic and overall completion status.

NUREG-0580-V11-N8 PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Regulatory Licensing Status Summary Report, Nuclear Power Plants Data for Decisions (Blue Book), July 11-August 16, 1982.
Aug 82, 73p
See also NUREG-0580-V11-N7.

The report provides a review of the status of the progress of the licensing reviews for all construction permits, operating license, special project and non-power reactor renewals under review, as reported to Congress.

PB82-266370 PC **A14**/MF **A01**
Bharat Heavy Electricals Ltd., Hyderabad (India). Corporate R and D Div.
Proceedings of Symposium on Power Plant Dynamics and Control (2nd) Held at Hyderabad on February 14-16, 1979.
Feb 79, 316p

Modeling and simulation have been recognized for quite some time as useful tools for identifying potential operational problems. Today, it is beginning to be accepted that it is essential to design the control system as an integral part of the power plant, instead of merely allowing it to grow as necessity dictates. In the design of such integral system, the role of plant dynamic studies is again critical. The need for operator training through the use of plant simulators is also recognized. The proceedings contain 36 papers and have been grouped under the 4 technical sessions namely, Thermal and Hydel Systems; Nuclear Systems; Power Plant Simulators; and Power Systems.

18F. Radiation Shielding and Protection

DE82012709 MF **A01**
Displacement Cascades in Polyatomic Solids.
D. Lesueur. 1981, 37p LA-tr-82-18
Contract W-7405-ENG-36
A , Philos. Mag., (Part) A, 44 n4 P905-929 1981.Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

An analytic calculation is presented which concerns the number of displaced j atoms n/sub kj/(E) by a primary k with an energy E in a polyatomic target. It can be applied in most irradiation cases: neutrons, electrons, and ion implantation. Its main limitation rests in its neglect of electron stopping power.

DE82014061 MF **A01**
Los Alamos National Lab., NM.
Methods for the Solution of the Two-Dimensional Radiation-Transfer Equation.
R. Weaver, D. Mihalas, and G. Olson. 1982, 41p LA-UR-82-961, CONF-820429-9
Contract W-7405-ENG-36
Los Alamos/CEA conference, Paris, France, 19 Apr 1982, Portions of document are illegible.
Available in microfiche only.

We use the variable Eddington factor (VEF) approximation to solve the time-dependent two-dimensional radiation transfer equation. The transfer equation and its moments are derived for an inertial frame of reference in cylindrical geometry. Using the VEF tensor to close the moment equations, we manipulate them into a combined moment equation that results in an energy equation, which is automatically flux limited. There are two separable facets in this method of solution. First, given the variable Eddington tensor, we discuss the efficient solution of the combined moment matrix equation. The second facet of the problem is the calculation of the variable Eddington tensor. Several options for this calculation, as well as physical limitations on the use of locally-calculated Eddington factors, are discussed. (ERA citation 07:045202)

DE82014071 PC **A03**/MF **A01**
Los Alamos National Lab., NM.
Variable Eddington Factors and Flux-Limiting Diffusion Coefficients.
P. P. Whalen. 1982, 27p LA-UR-82-1037, CONF-820429-10
Contract W-7405-ENG-36
Los Alamos/CEA conference, Paris, France, 19 Apr 1982.

Variable Eddington factors and flux limiting diffusion coefficients arise in two common techniques of closing the moment equations of transport. The first two moment equations of the full transport equation are still frequently used to solve many problems of radiative or particle transport. An approximate analysis, developed by Levermore, exhibits the relation between the coefficients of the two different techniques. This analysis is described and then used to test the validity of several commonly used flux limiters and Eddington factors. All of the ad-hoc flux limiters have limited validity. All of the variable Eddington factors derived from some underlying description of the angular distribution function are generally valid. The use of coefficients from Minerbo's elegant maximum entropy Eddington factor analysis is suggested for use in either flux limited diffusion or variable Eddington factor equations. (ERA citation 07:045204)

DE82014574 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Criticality Assessment of Basket Designs for Use in the MH-1A Shipping Cask.
J. T. Thomas. Apr 82, 32p ORNL/CSD/TM-172
Contract W-7405-ENG-26

An analytical study is made of a proposed stainless steel basket to be used in the MH-1A cask for the shipment of National Bureau of Standards reactor fuel elements. The use of B sub 4 C in the basket as a primary control for the prevention of criticality is shown to be effective but not necessary. A basket fabricated of 0.635-cm-thick stainless steel provides a sufficient margin of subcriticality. (ERA citation 07:044353)

DE82903043 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.
Study of an Advanced Containment System for New LWR Power Plants.
G. Petrangeli. Dec 80, 43p CNEN-RT/DISP-(80)4/bis
Translation of CNEN-RT/DISP(80)4 report.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The problem of containment of radioactive products after an accident in Nuclear Power Stations is reviewed in the light of the Three Mile Island experience, of the available proven technology and of social and economic considerations. An example of total containment is described, suitable for new power stations. Its

capability of keeping the calculated consequences of accidents, including those with substantial core damage, within the limits of the Three Mile Island event is discussed. (ERA citation 07:043733)

18G. Radioactive Wastes and Fission Products

DE82000531 MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC.
Development of Borosilicate Glass for the Vitrification Plant PAMELA.
W. Lutze, E. Schiewer, and A. K. De. 1981, 18p DP-tr-20
Contract AC09-76SR00001
D .Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Federated Republic of Germany established in the Eurochemic in Mol, Belgium, a plant, PAMELA, for solidification of so-called LEWC (low enriched waste concentrate). The concern there is with 65 m exp 3 of high radioactivity waste inherited from reworking of fuel elements in the years 1967 to 1974. In this plant the HLW will be fused in borosilicate glass and then equal amounts will be either drawn off into molds or imbedded as glass beads in lead (as so-called Vitromets). The vitrification will be carried out in a melting pot with direct electrical heat. Nothing is reported here about the technical layout of the solidification plant. The state of development of the borosilicate glass at the Hahn-Meitner Institute, the relationship between glass formation, technical limiting conditions, and composition of the waste are discussed.

DE82008565 PC **A03**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Selected Transuranic Waste Immobilization Systems.
C. L. Timmerman, R. L. Treat, and W. A. Ross. Dec 81, 35p PNL-SA-9969, CONF-820620-1
Contract AC06-76RL01830
ASME meeting, Portland, OR, USA, 1 Jun 1982.

Waste contaminated with transuranic (TRU) elements may require treatment prior to final disposal. Pacific Northwest Laboratory has conducted research and development to identify and characterize the wastes; to evaluate the possible immobilization requirements and treatment alternatives; and to develop immobilization process technologies. This paper describes systems that are anticipated to be capable of immobilizing a selected TRU waste stream consisting of a blend of process sludge and incinerator ash. The selected waste streams are based on the waste compositions generated at the Rocky Flats Plant, Golden, Colorado. The specific process and waste forms are: in-can glass melting, borosilicate glass monolith; joule-heated glass melting, borosilicate/aluminosilicate glass monolith; glass marble, borosilicate/aluminosilicate glass marble; basalt glass-ceramic, basalt glass-ceramic monolith; cast cement, cast cement monolith; pressed cement, pressed cement pellet; and cold-pressed sintered ceramic, pressed ceramic pellet.

DE82011531 MF **A01**
Virginia Polytechnic Inst. and State Univ., Blacksburg.
Analysis by Simulation of the Disposition of Nuclear-Fuel Waste.
J. L. Turek. Sep 80, 178p DOE/SR/01008-05
Contract AC09-77SR01008
Thesis. Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

To achieve the non-proliferation objectives of the United States, the reprocessing of spent nuclear fuel was discontinued in 1977. Since current at-reactor storage capacity is based upon a nuclear fuel cycle which includes reprocessing, this halt in reprocessing is causing large quantities of non-storable spent fuel. Permanent nuclear waste storage repositories will not be available until the end of the century. Present Department of Energy policy calls for sufficient interim Away-From-Reactor (AFR) Storage capacity to insure that no commercial reactor has to shutdown due to inadequate storage space for discharged spent fuel. A descriptive simulation model is developed which includes all aspects of nuclear waste disposition. The model is comprised of two systems, the second system orchestrated by GASP IV. A spent fuel generation prediction module is interfaced with the AFR Program Management Information System and a repository scheduling inforrnation module. The user is permitted a wide range of options with which to tailor the simulation to any desired storage scenario. The model projects storage requirements through the year 2020. The outputs are evaluations of the impact that alternative decision policies and milestone date changes have on the demand for, the availability of, and the utilization of spent fuel storage capacities. Both graphs and detailed listings are available. These outputs give a comprehensive view of the particular scenario under observation, including the tracking, by year, of each discharge from every reactor. Included within the work is a review of the status of spent fuel disposition based on input data accurate as of August 1980.

DE82012541 MF **A01**
Atomics International Div., Richland, WA. Rockwell Hanford Operations.
Basalt Waste-Isolation Project. Quarterly Report, January 1-March 31, 1981.
May 81, 145p RHO-BWI-81-100-2Q
Contract AC06-77RL01030
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

This document reports progress made in the Basalt Waste Isolation Project during the second quarter of fiscal year 1981. Efforts are described for the following End Functions of the project work breakdown structure: systems; waste package; site; repository; exploratory shaft test facility; regulatory and institutional; near-surface test facility Phase I; near-surface test facility Phase II; and support facilities. (ERA citation 07:042569)

DE82012567 PC **A05**/MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Energy Systems Div.
Spent Fuel Dry Storage Technology Development: Electrically Heated Drywell Storage Test (3KW Operation).
R. Unterzuber, and J. P. Hanson. Sep 81, 99p DOE/NV/10171-1
Contract AC08-81NV10171

An electrically heated drywell storage cell test has been in operation since March 1978 at the Engine-Maintenance, Assembly and Disassembly (E-MAD) facility on the Nevada Test Site in support of spent fuel dry storage technology development. This document presents the test data obtained at electric heater power output of 3.0 kW and compares the data with that for heater power outputs of 1.0 kW and 2.0 kW. The simulated drywell storage cell consists of a stainless steel canister (representative of the spent fuel canisters being tested at E-MAD) containing an electrical heater assembly, a concrete-filled shield plug to which the canister is attached, and a carbon steel liner that encloses the canister and shield plug. The entire test drywell is grouted into a hole drilled in the soil adjacent to E-MAD. Temperature instrumentation is provided on the exterior of the canister and liner, in the grout around the liner, and at six radial locations in the soil surrounding the drywell. Peak measured canister and liner temperatures are 785 exp 0 F and 747 exp 0 F, respectively. Previous testing showed peak measured canister and liner temperatures of 276 exp 0 F and 232 exp 0 F for 1.0 kW and 506 exp 0 F and 458 exp 0 F for 2.0 kW, respectively. A previously developed computer model was utilized to predict the thermal response of the test configuration. Computer predictions of the transient and steady-state temperatures of the drywell components and surrounding soil are presented and are compared with the test data. (ERA citation 07:042450)

DE82012626 PC **A03**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Technical Plan for the Development of an Assay System for the INEL Stored TRU Waste.
J. P. Hinckley. Feb 82, 33p EGG-WM-5792
Contract AC07-76ID01570

The purpose of the Stored Waste Experimental Pilot Plant (SWEPP) will be to certify that the stored waste is in compliance with the Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC), which have been specified by the WIPP. In order to certify the waste, the containers will be weighed, examined by x-ray and (possibly) neutron radiography to identify acceptable waste forms, checked to see that the container is still sound by ultrasonic or eddy current techniques, and assayed to determine the amount of fissile material in the container and its thermal power density. Waste shown by these tests to be in compliance with the WAC will be labeled accordingly and shipped to the WIPP. The proposed waste assay development is an adaptation of existing, proven, techniques to determine the fissile inventory of TRU waste containers. The passive assay capabilities of the system have already been demonstrated with 1.2 x 1.2 x 2.4 m crates. The active Differential Die-Away Technique (DDT) capabilities have been demonstrated with 55-gallon barrels but not with crates. Consequently the only major technological uncertainties in the waste assay development program center around the effect on system assay time and accuracy of scaling the DDT barrel counter up to a counter which will handle INEL boxes, bins, and drums. These uncertainties will be resolved by experimental and development work performed in FY 1982. Further development and modifications to an operating prototype system will be accomplished during FY 1983-1984 so that a fully operational DDT crate assay system will be available to the SWEPP in FY 1985.

DE82013687 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Transportation of Radioactive Material by Rail: Special Train Issue.
D. Klassen. Apr 82, 11p SAND-81-1447, TTC-0226
Contract AC04-76DP00789
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The shipment of radioactive material by rail has been the subject of intense legal maneuvers. The railroads, responding to a perceived safety issue, wanted to require a separate contract for each shipment of nuclear material which, in many cases, would require special train service. The nuclear industry and government opposed this position as being unnecessarily expensive and not contributing significantly to the safety of nuclear material transport. The Supreme Court upheld earlier lower court and Interstate Commerce Commission rulings which held that the railroads had to act in the capacity of common carriers of nuclear materials and that they could not require a separate contract for each nuclear material shipment.

DE82013738 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Interaction of Palladium, the Rare Earths, and Silver with Silicon Carbide in HTGR Fuel Particles.
R. L. Pearson, R. J. Lauf, and T. B. Lindemer. Apr 82, 37p ORNL/TM-8059
Contract W-7405-ENG-26
Microfiche only after original copies are exhausted.

The interactions of the simulated fission products palladium, rare earths, and silver with the silicon carbide (SIC) Triso-coated, high-temperature, gas-cooled reactor (HTGR) particles were investigated out-of-reactor in the temperature range 1500 to 1780 K. Both palladium and the rare earths interact in proportion to time (rather than the square root of time) up to 8600 h (0.98 year), the time limit of the study. Grain-boundary mechanisms are suggested. Effects of the SiC microstructure on the palladium reaction rate were minimal in comparison to the temperature effects. Silver interactions with SiC were observed, but could not be quantified. In a second set of experiments, the addition of silicon to carbide-containing kernels resulted in retention of U-Pd-Si-C compounds in the kernel. These prevented the reaction of palladium with SiC at temperatures of 1670 to 1920 K as long as rare-earth carbides were not present.

DE82013825 MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Chemical Durability of Glass Containing SRP Waste: Leachability Characteristics, Protective Layer Formation, and Repository System Interactions.
G. G. Wicks, B. M. Robnett, and W. D. Rankin. 1982, 11p DP-MS-81-122, CONF-820636-1
Contract AC09-76SR00001
International symposium on the scientific basis for radioactive waste management, Berlin, F.R. Germany, 7 Jun 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Repository Systems Program at Savannah River consists of the following elements: (a) static repository tests, (b) slow flow groundwater tests, (c) dynamic leaching experiments, (d) long term leaching tests, and (e) in situ experiments. The scouting tests performed in the static repository program are summarized and a new dynamic leaching concept is introduced in this paper. Abbreviated MCC-1 static leaching tests were used in this static repository program. The tests were conducted at 90 exp 0 C for 7 days with deionized water as well as repository groundwaters as leachants. The static repository program consisted of three phases. Phase 1 of the study evaluated the leachability of SRP waste glass leached in the presence of salt, basalt, shale, granite, and tuff at three different ratios of surface areas of sample to volume of leachant (SA/V). These data were then compared to tests on similar glasses leached in the absence of rock. The second phase of this program evaluated the effects of five simulated groundwaters on the leachability of waste glass both with and without host rock present and compared these results to glass leached by deionized water. The groundwaters included many minor as well as major constituents. The third and final phase of the program evaluated waste glass leachability as a function of tests conducted in the presence of candidate canister and overpack metals, backfill mixtures, and five complete package systems. The sample matrices are given in Table 2 and the data are summarized. (ERA citation 07:044230)

DE82013976 MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Quality Assurance Considerations in Nuclear Waste Management.
W. L. Delvin. 12 Feb 82, 10p HEDL-SA-2648, CONF-820424-14
Contract AC06-76FF02170
ANS topical meeting on treatment and handling of radioactive wastes, Richland, WA, USA, 19 Apr 1982.
Available in microfiche only.

Proper use of quality assurance will provide the basis for an effective management control system for nuclear waste management programs. Control is essential for achieving successful programs free from costly losses and failures and for assuring the public and regulators that the environment and health and safety are being protected. The essence of quality assurance is the conscientious use of planned and systematic actions, based on selecting and applying appropriate requirements from an established quality assurance standard. Developing a quality assurance program consists of using knowledge of the technical and managerial aspects of a project to identify and evaluate risks of loss and failure and then to select appropriate quality assurance requirements that will minimize the risks. Those requirements are integrated into the project planning documents and are carried out as specific actions during the life of the project. (ERA citation 07:042533)

DE82014221 PC **A11**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Assessment of Processes, Facilities, and Costs for Alternative Solid Forms for Immobilization of SRP Defense Waste.
J. B. Dunson, Jr., A. M. Eisenberg, R. L. Schuyler, III, H. G. Haight, Jr., and V. E. Mello. Mar 82, 228p DP-1625
Contract AC09-76SR00001
Portions of document are illegible.
Microfiche only after original copies are exhausted.

A quantitative merit evaluation which assesses the relative difficulty of remote processing of Savannah River Plant high-level wastes for seven alternative waste forms is presented. The reference borosilicate glass process is rated as the simplest, followed by FUETAP concrete. The other processes evaluated in order of increasing complexity were: glass marbles in a lead matrix, high-silica glass, crystalline ceramic (Synroc-D and tailored ceramic), and coated ceramic particles. Cost appraisals are summarized for the borosilicate glass, high-silica glass, and ceramic waste form processing facilities. (ERA citation 07:042510)

DE82014345 PC **A05**/MF **A01**
Bechtel National, Inc., Oak Ridge, TN.
Conceptual Design Report: Below-Grade Bulk Waste Disposal Facility. Formerly Utilized Sites Remedial Action Program.
Apr 82, 96p DOE/OR/20722-2
Contract AC05-81OR20722
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This report presents two conceptual designs for below-grade land disposal facilities in the Northeastern United States for wastes managed under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The wastes are low specific activity radioactive wastes generated by programs of the Manhattan Engineer District/Atomic Energy Commission (MED/AEC). One design presented is for a hypothetical disposal facility for the state of New York and one for the state of New Jersey. Each design is based on the estimated volume of FUSRAP waste in each state. Since no specific sites have been identified for the disposal facilities, the geologic, hydrologic, topographic, and meteorologic conditions chosen for the conceptual design are only representative of conditions in New York and New Jersey. The principal difference in the two sites is the assumed soil permeability which requires an engineered clay liner surrounding the waste for the New York facility, but not for the New Jersey facility. The conceptual designs are intended to be conservative and were developed to be compatible with proposed 10 CFR 61 and proposed 40 CFR 192. The designs are developed in sufficient detail to verify the feasibility of the design concepts and to provide a basis for developing capital cost estimates for below-grade land disposal facilities.

DE82014394 MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Review of Potential Host Rocks for Radioactive Waste Disposal in the Southern Piedmont.
I. W. Marine, and H. W. Bledsoe. 1982, 11p DP-MS-81-96, CONF-820352-2
Contract AC09-76SR00001
Geological Society of America southeastern section meeting, Washington, DC, USA, 25 Mar 1982, Portions of document are illegible.
Available in microfiche only.

A federal geologic repository is being considered for the disposal of radioactive waste. The geological literature on the Southern Piedmont was studied to identify rock bodies worthy of field exploration for site selection. The study was geotechnical in nature and no consideration was given to socioeconomic factors. There were 13 geotechnical criteria applied in this study of the Southern Piedmont to arrive at a recommendation for further studies on 29 rock bodies. In general, information from the literature included the geometry and depth of the rock body, the lithology and mineralogy of the body, mineral resources, and seismicity of the area. Some rock properties, such as physical, chemical, and thermal characteristics, can be inferred from the lithology and mineralogy of the rock. The subjects on which information from the literature was generally lacking were hydrology and in situ stress. This study was unable to infer the gross hydrologic characteristics from the abundant data in the literature on lithology and structure because few geologic studies report the hydrologic characteristics. (ERA citation 07:042514)

DE82014442 PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Processability Analysis of Candidate Waste Forms.
T. H. Gould, Jr., J. B. , Dunson, Jr., A. M. Eisenberg, H. G. Haight, Jr., and V. E. Mello. 1982, 20p DP-MS-81-111, CONF-820547-5
Contract AC09-76SR00001
84. annual meeting of the American Ceramic Society, Cincinnati, OH, USA, 2 May 1982.

A quantitative merit evaluation, or processability analysis, was performed to assess the relative difficulty of remote processing of Savannah River Plant high-level wastes for seven alternative waste form candidates. The reference borosilicate glass process was rated as the simplest, followed by FUETAP concrete, glass marbles in a lead matrix, high-silica glass, crystalline ceramics (SYNROC-D and tailored ceramics), and coated ceramic particles. Cost estimates for the borosilicate glass, high-silica glass, and ceramic waste form processing facilities are also reported.

DE82014498 MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Chemical Durability of Savannah River Plant Waste Glass as a Function of Groundwater pH.
G. G. Wicks, P. E. O'Rourke, and P. G. Whitkop. 1982, 26p DP-MS-81-104, CONF-820547-6
Contract AC09-76SR00001
84. annual meeting of the American Ceramic Society, Cincinnati, OH, USA, 2 May 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The leachability of Savannah River Plant (SRP) waste glass was assessed for leachants in the pH range of 3 to 11. A parabolic relationship was observed between leachability and solution pH in this range. At 40 exp 0 C, leachability was lowest within a pH range of approximately 5 to 9. Most of the groundwaters in potential repository locations have pH values in this range. Below pH 5 and above pH 9, leachability of the waste glass increases. Leachability as a function of solution pH was studied first at room temperature and then in more detail at 40 exp 0 C, 90 exp 0 C, and 150 exp 0 C using abbreviated MCC-1 and MCC-2 static leaching tests. These data were then correlated with the formation and stabilization of surface layers that are produced on the waste glass during leaching. (ERA citation 07:042515)

DE82014548 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Uranium Recovery Research Sponsored by the Nuclear Regulatory Commission at Pacific Northwest Laboratory. Quarterly Progress Report, January-March 1982. Interim Report.
L. C. Schwendiman, G. W. Gee, J. N. Hartley, J. Mishima, and D. R. Sherwood. Apr 82, 76p PNL-4105-2
Contract AC06-76RL01830

Pacific Northwest Laboratory (PNL) has in progress several discrete investigations for the US Nuclear Regulatory Commission (NRC) concerned with process wastes during the active life of uranium mills and during an extended period following their shutdown. The overall objective of this research is to provide NRC and their licensees with technical guidance on several issues related to management of wastes from uranium mills and in situ recovery operations. Principal issues addressed in these studies are designs and performance of radon-suppression covers, the incentives, and constraints in using rock covers (riprap) as well as their design for armoring tailings pile covers, shorter term stabilization options for controlling windblown particles, leachate movement in soil, tailings dewatering, disposal deliberately below the water table, neutralization incentives, contamination control and restoration in in situ uranium recovery and effluent and environmental measurements, instrumentation and protocols. It is expected that many results of these studies will be used in developing regulatory guides and better evaluation of environmental impacts during and following the active life of a uranium recovery facility. Progress on each of several separately identified areas is reported. The information reported is preliminary and conclusions should be regarded as tentative. About 20 topical reports are scheduled during the year to provide detailed description of phases of the work and conclusions therefrom. (ERA citation 07:042558)

DE82014971 PC **A07**/MF **A01**
Exxon Nuclear Idaho Co., Inc., Idaho Falls.
Ninth Processing Campaign in the Waste Calcining Facility.
K. F. Childs, R. I. Donovan, and M. C. Swenson. Apr 82, 131p ENICO-1100
Contract AC07-79ID01675
Microfiche only after original copies are exhausted.

This report discusses the Ninth (and final) Processing Campaign at the Waste Calcining Facility. Several processing interruptions were experienced during this campaign and the emphasis of this report is on process and equipment performance with operating problems and corrective actions discussed in detail. (ERA citation 07:042527)

DE82015233 PC **A21**/MF **A01**
Mississippi State Univ., Mississippi State. Dept. of Nuclear Engineering.

Economic Impact of Federal Regulation on the Backend of the Nuclear Fuel Cycle (AFR Storage and Transportation). Final Technical Report, September 30, 1977-December 31, 1979.
R. S. Reynolds, C. A. Sparrow, J. G. Cesare, Jr., B. C. Armstrong, Jr., and M. W. Parker. 1979, 494p
DOE/ET/01036-7
Contract AS09-77SR01036
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This work outlines a general analysis procedure which can be used to evaluate regulations affecting the backend of the nuclear fuel cycle. The regulation chosen for study is the proposed 10CFR72, Storage of Spent Fuel in an Independent Spent Fuel Storage Installation (ISFSI). A Risk Matrix has been developed as part of the proposed analysis procedures. This matrix is defined by thirty-seven backend NFC cost centers, seven risk categories for each cost center and eight consequence recipients for each category. In order to support the Risk Matrix, risk algorithms, and the analysis procedures, a data base and the necessary data base management codes have also been developed and demonstrated. In order to demonstrate the implementation and risk assessment components of the model, two studies were undertaken. A comparative economic study of AFR storage alternatives has been performed to show how implementation studies are important in regulatory analysis. Additionally, a detailed risk cost assessment of spent fuel transportation by rail and truck to hypothetical AFR's has been performed. In addition to demonstrating overall model components including the Risk Matrix and the data base, these two studies provide valuable information on topics of national interest to the nuclear industry and government.

DE82015250 MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Utah State Briefing Book for Low-Level Radioactive Waste Management.
Oct 81, 146p DOE/ID/01570-T24
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Utah State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Utah. The profile is the result of a survey of NRC licensees in Utah. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in Utah.

DE82015271 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Washington State Briefing Book for Low-Level Radioactive Waste Management.
Dec 80, 145p DOE/ID/01570-T43, NUS-3635C
Contract AC07-76ID01570
Portions of document are illegible.
Available in microfiche only.

The Washington State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Washington. The profile is the result of a survey of NRC licensees in Washington. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in Washington. (ERA citation 07:042494)

DE82015272 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Wisconsin State Briefing Book for Low-Level Radioactive Waste Management.
Nov 80, 136p DOE/ID/01570-T27
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Wisconsin State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Wisconsin. The profile is the result of a survey of NRC licensees in Wisconsin. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in Wisconsin.

DE82015273 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Wyoming State Briefing Book for Low-Level Radioactive Waste Management.
Oct 81, 190p DOE/ID/01570-T42
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Wyoming State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Wyoming. The profile is the result of a survey of NRC licensees in Wyoming. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in Wyoming. (ERA citation 07:042493)

DE82015276 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Maine State Briefing Book on Low-Level Radioactive Waste Management.
Aug 81, 201p DOE/ID/01570-T46
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Maine State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and Federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Maine. The profile is the result of a survey of radioactive material licensees in Maine. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested partices including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact management practices in Maine. (ERA citation 07:042495)

DE82015279 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Vermont State Briefing Book on Low-Level Radioactive Waste Management.
Jul 81, 189p DOE/ID/01570-T28
Contract AC07-76ID01570
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The Vermont State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Vermont. The profile is the result of a survey of Nuclear Regulatory Commission licensees in Vermont. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may affect waste management practices in Vermont.

DE82015280 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Pennsylvania State Briefing Book for Low-Level Radioactive Waste Management.
Apr 81, 332p DOE/ID/01570-T35, SRC-7068-5
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The Pennsylvania State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Pennsylvania. The profile is the result of a survey of NRC licensees in Pennsylvania. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in Pennsylvania. (ERA citation 07:042492)

DE82015284 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
South Dakota State Briefing Book for Low-Level Radioactive Waste Management.
Oct 81, 161p DOE/ID/01570-T31
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The South Dakota State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in South Dakota. The profile is the result of a survey of NRC licensees in South Dakota. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact

waste management practices in South Dakota. (ERA citation 07:042491)

DE82015285 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
New Jersey State Briefing Book for Low-Level Radioactive Waste Management.
Apr 81, 307p DOE/ID/01570-T56
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The New Jersey state Briefing Book is one of a series of State briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in New Jersey. The profile is the result of a survey of NRC licensees in New Jersey. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in New Jersey. (ERA citation 07:042497)

DE82015286 MF **A01**
EG and , 309p DOE/ID/01570-T55
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The New Mexico State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in New Mexico. The profile is the result of a survey of NRC licensees in New Mexico. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in New Mexico.

DE82015287 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
West Virginia State Briefing Book for Low-Level Radioactive Waste Management.
Jul 81, 197p DOE/ID/01570-T25
Contract AC07-76ID01570
Portions of document are illegible.
Available in microfiche only.

The West Virginia State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in West Virginia. The profile is the result of a survey of NRC licensees in West Virginia. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in West Virginia. (ERA citation 07:042489)

DE82015290 MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Maryland and District of Columbia State Briefing Book for Low-Level Radioactive Waste Management.
Sep 81, 242p DOE/ID/01570-T50, NUS-3788
Contract AC07-76ID01570
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The District of Columbia and Maryland State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in the District of Columbia and Maryland. The profile is the result of a survey of NRC licensees in the District of Columbia and Maryland. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may impact waste management practices in the District of Columbia and Maryland.

DE82015295 MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Minnesota State Briefing Book on Low-Level Radioactive Waste Management.
Jul 81, 182p DOE/ID/01570-T57
Contract AC07-76ID01570
Portions of document are illegible.
Available in microfiche only.

The Minnesota State Briefing Book is one of a series of state briefing books on low-level radioactive waste management practices. It has been prepared to assist state and federal agency officials in planning for safe low-level radioactive waste disposal. The report contains a profile of low-level radioactive waste generators in Minnesota. The profile is the result of a survey of Nuclear Regulatory Commission licensees in Minnesota conducted by the Minnesota Department of Health. The briefing book also contains a comprehensive assessment of low-level radioactive waste management issues and concerns as defined by all major interested parties including industry, government, the media, and interest groups. The assessment was developed through personal communications with representatives of interested parties, and through a review of media sources. Lastly, the briefing book provides demographic and socioeconomic data and a discussion of relevant government agencies and activities, all of which may affect waste management practices in Minnesota.

DE82015503 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Three-Dimensional Thermal Analysis for a Conceptual High-Level Waste Repository in Welded Tuff.
W. D. Sundberg, and R. R. Eaton. Apr 82, 30p
SAND-81-0215
Contract AC04-76DP00789
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A near-field, three-dimensional, thermal-conduction analysis was done for 2.16-kW high-level waste canisters emplaced in welded tuff. Initial thermal loadings of 75 and 100 kW/acre were investigated. The conductivities used were 2.4 W/m. exp 0 C for the saturated tuff and 1.55 W/m. exp 0 C for the dry tuff. The tuff was modeled as always saturated and with boiling of the interstitial water. Calculations were done with the ADINAT finite-element code and associated pre- and post processor codes. For the 100-kW/acre initial loading, boiling of the interstitial water, and an initial temperature of 35 exp 0 C, the maximum canister temperature was 296 exp 0 C.

DE82015754 PC **A04**/MF **A01**
Artic Research, Littleton, CO.
Elemental Release from Glass and Spent Fuel.
G. L. McVay, D. J. Bradley, and J. F. Kircher. Oct 81, 63p ONWI-275
Contract AC06-76RL01830

In the past several years, emphasis on waste form-aqueous solution interactions has shifted from data gathering to understanding. With this new emphasis, numerous mechanistic investigations have been initiated. These rely heavily on surface analytical techniques and control of many of the variables. Out of these recent efforts has come new insight into interactions between waste forms and water. This document concentrates upon glass and spent fuel waste forms. Leach testing methods and the status of glass and spent fuel leaching are discussed. The parameters studied in leaching tests are, pH and Eh effects, temperature effects, leachate composition, radiation effects, solubility, mechanisms and models, and oxygen level. Some of the highlights are: radiolysis effects in the absence of air have been shown to be important at lower temperatures but not significant at elevated temperatures expected in a repository; in the presence of air, nitric acid is generated as a radiolysis product; spent fuel leaching is less sensitive to temperature change than glass; as the oxygen content of the leachate decreases, actinide removal also decreases from both glass and spent fuel; in general, existing release models for glass and spent fuel are not adequate to predict long-term behavior in a meaningful and believable manner. 87 references.

DE82016026 PC **A02**/MF **A01**
Westinghouse Electric Corp., Mercury, NV. Advanced Energy Systems Div.
Commercial Nuclear Waste Research and Development Program. Quarterly Report, October-December 1981.
A. R. Hakl. Jan 82, 20p DOE/NV/10250-1
Contract AC08-82NV10250

This document is a report of activities performed by AESD-Nevada Operations in meeting task objectives of the Nevada Nuclear Waste Storage Investigations (NNWSI) planning documentation for Fiscal Year (FY) 1982. Significant activities were: Completion of a fuel assembly exchange was successfully in support of the Spent Fuel Test-Climax (SFT-C) Program; input was provided, in response to FY 1982 guidance, to DOE/NV and the Office of Nuclear Waste Isolation (ONWI) for a proposed co-located Generic Packaging Facility (GPF); in response to FY 1982 guidance, drafts were prepared of facility layouts, material and process flow charts, equipment requirements, costs, and schedules for packaging (at E-MAD) of 28 alternative configurations of defense high-level waste, disassembled spent fuel, and commercial high-level waste in support of a proposed Test and Evaluation Facility (TEF); and quarterly dry run operations for canister emplacement in a drywell and in the Hot Bay Transfer Pit using the Emplacement/Installation Vehicle.

DE82016069 PC **A04**/MF **A01**
Ford, Bacon and Davis Utah, Inc., Salt Lake City.
Summary of the Engineering Assessment of Inactive Uranium-Mill Tailings: Canonsburg Site, Canonsburg, Pennsylvania.
Apr 82, 73p DOE/UMT-0101S
Contract AC04-76GJ01658

Ford, Bacon and Davis Utah Inc. has evaluated the Canonsburg site in order to assess the problems resulting from the existence of radioactive residues at Canonsburg, Pennsylvania. This engineering assessment has included the preparation of topographic maps, radiometric measurements sufficient to determine areas and volumes of tailings and radiation exposures of individuals and nearby populations, the investigations of site hydrology and meteorology, and the evaluation and costing of alternative remedial actions. Radon gas released from the approximately 300,000 tons of tailings and contaminated soil at the Canonsburg site constitutes the most significant environmental impact, although windblown tailings and external gamma radiation also are factors. The four alternative actions presented in this engineering assessment range from millsite and off-site decontamination with the addition of 3 m of stabilization cover material (Option I), to removal of the tailings and contaminated materials to a remote disposal site and decontamination of the Canonsburg site (Options II through IV). Cost estimates for the four options range from $23,244,000 for stabilization in-place, to $27,052,000 for disposal at a distance of about 17 mi. Three princi-

pal alternatives for the reprocessing of the Canonsburg tailings were examined: heap leaching; treatment at an existing mill; and reprocessing at a new conventional mill constructed for tailings reprocessing. As required by Public Law 95-604, under whose auspices this project is conducted, the US Department of Energy has solicited expressions of interest in reprocessing the tailings and residues at the Canonsburg site for uranium recovery. Since no such interest was demonstrated, no effort has been made to estimate the value of the residual uranium resource at the Canonsburg site.

DE82016269 PC **A06**/MF **A01**
Brookhaven National Lab., Upton, NY.
Waste-Form Development Program. Annual Progress Report, October 1980-September 1981.
R. M. Neilson, Jr., and P. Colombo. Jan 82, 115p
BNL-51517
Contract AC02-76CH00016
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In the Waste Form Development Program, contemporary solidification agents are being investigated relative to their potential applications to major fuel cycle and non-fuel cycle low-level radioactive wastes. Work conducted during FY 1981 focused on the solidification of ion exchange resin wastes, oils and organic liquids, incinerator ash waste and nitrate salt wastes. The solidification agents employed included portland and high alumina cements, a proprietary gypsum-based polymer modified cement, and thermosetting plastics. Work was conducted to determine compositional envelopes which produced acceptable waste forms. Formulation acceptability required production of a free standing monolithic solid with no free standing water which also passed a two-week water immersion test without a loss of mechanical integrity. After formation development work was completed, waste forms were tested to develop a property data base relevant to performance evaluations in disposal and during transportation and interim storage. Preliminary results of an effort to identify inexpensive, well characterized, readily available commercial additives that can be incorporated into waste forms to increase activity retention in leaching environments are described. Work was also performed to determine the leaching characteristics of ALARA MONOLITH polymer waste forms in support of a demonstration at the Maxey Flats, Kentucky, shallow land burial disposal site.

DE82750120 MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Chemische Technologie.
Tritium Recovery from Zircaloy Cladding Hulls of LWR Spent Fuel Elements.
B. Mueller, F. Kreutz, and K. Kroth. May 81, 36p
Juel-1715
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Tritium can be desorbed up to 98% by a simple method from LWR spent fuel cladding hulls. To accomplish this, cladding hulls are induction heated at temperatures up to 1100 exp 0 C. The desorption is possible using hydrogen or with vacuum. Zircaloy-IV cladding simples which received a burn up of 30.000 MWd/t at a power density of 180 W/cm yielded 1140 mu Ci tritium per gramme of zircaloy. The results of the desorption experiments are confirmed by a dissolution method and control tests with standardized tritium samples. (ERA citation 07:042540)

DE82901450 MF **A01**
Electric Power Research Inst., Palo Alto, CA.
Workshop on Iodine Releases in Reactor Accidents.
Nov 80, 182p EPRI-NSAC-14
Best available copy from document source. Available in microfiche only.

Principal conclusions from the workshop can be summarized: Observed environmental releases of iodine from actual reactor accidents are several factors of 10 smaller than those predicted by licensing bases. The presence of water apparently prevents large fractions of iodine released from fuel from being airborne, either inside or outside containments or other enclosures. There is evidence that with fuel overheating in a loss-of-coolant accident iodine will be released mainly as cesium iodide, a thermodynamically stable substance which dissolves in water. Exaggerated estimates of potential accident releases can contribute to unfounded actions by public officials and unwarranted physical and mental stress damage to the public. Ten presentations were made at the workshop. These presentations are summarized and the viewographs used are given in this document. Separate abstracts were prepared for three presentations. (ERA citation 07:043661)

DE82903053 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Radiazioni e Ricerche di Sicurezza e Protezione.
Uranium Recovery from Corrosion Products Polluted Solutions Plant Design.
G. Beone, G. Caropreso, and G. Galuppi. 1980, 80p
CNEN-RT/CHI-(80)3
In Italian.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

A service plant with relative specifications of uranium recovery from aqueous and organic polluted solutions has been designed. The report is particularly constituted of process and plant design, non constructive sketches of any component, the services and instrumentation. Moreover, it contains the executive and assembling design of two units of plant (denitration and concentration). (ERA citation 07:042484)

DE82903200 MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Treatment of Spent Ion-Exchange Resins for Disposal.
R. A. Speranzini, and L. P. Buckley. Sep 81, 45p
AECL-7411, CONF-8109131-1
IAEA research co-ordination meeting on the treatment of spent ion-exchange resins, Toronto, Canada, 21 Sep 1981.
Best available copy from document source. Available in microfiche only.

Ion-exchange resins are used in CANDU-PHW nuclear power stations to purify heavy water in the primary heat transport (PHT) and moderator systems. Two promising techniques for conditioning spent ion-exchange resins for disposal have been evaluated: direct immobilization and incineration combined with immobilization of the ash and scrubbed offgases. When ion-exchange resins were immobilized directly, no volume reductions were obtained at the various resin to matrix weight ratios attempted. Volumes of bitumen and glass products were equal to the volumes of untreated resin while the volumes of cement and polyester products were 2 and 3 times larger. While incinerating the resin is an extra processing step, high reductions in volume result from the latter option. Bitumen and glass product volumes were six times smaller than the volumes of untreated resin while cement and polyester product volumes were about one-half the volume of untreated resin. Since the releases of Cs-137 were about ten times lower for products made by direct immobilization, PHT resins, which have high concentrations of Cs-137, should be immobilized directly. Moderator resins which have high concentrations of C-14 should be incinerated and the ash- and C-14-contaminated scrubbing solutions should be immobilized. By pretreating such resins with calcium chloride, the C-14 present on resin could be released at temperatures below the ignition temperature of the resin. This technique reduces the amount of inactive carbon dioxide that must be scrubbed to trap the C-14. The releases of C-14 from immobilized barium hydroxide scrubbing solution were the same as releases from immobilized resin. (ERA citation 07:045907)

NUREG/CR-1030-V3 PC **A11**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Sediment and Radionuclide Transport in Rivers. Phase 3. Field Sampling Program for Cattaraugus and Buttermilk Creeks, New York,
R. M. Ecker, W. H. Walters, and Y. Onishi. Aug 82, 230p PNL-3117
See also Phase 2, NUREG/CR-1030-V2.

A field sampling program was conducted on Cattaraugus and Buttermilk Creeks, New York during April 1979 to investigate the transport of radionuclides in surface waters as part of a continuing program to provide data for application and verification of Pacific Northwest Laboratory's (PNL) sediment and radionuclide transport model, SERATRA. Bed sediment, suspended sediment and water saples were collected during unsteady flow conditions over a 45 mile reach of stream channel. Radiological analysis of these samples included gamma ray spectrometry analysis, and radiochemical separation and analysis of Sr-90, Pu-238, Pu-239, 240, Am-241 and Cm-244. Tritium analysis was also performed on water samples. Based on the evaluation of radionuclide levels in Cattaraugus and Buttermilk Creeks, the Nuclear Fuel Services facility at West Valley, New York, may be the source of Cs-137, Sr-90, Cs-134, Co-60, Pu-238, P-239-240, Am-241, Cm-244 and tritium found in the bed sediment, suspended sediment and water of Buttermilk and Cattaraugus Creeks. This field sampling effort was the last of a three phase program to collect hydrologic and radiologic data at different flow conditions.

NUREG/CR-2438 PC **A04**/MF **A01**
Exxon Nuclear Idaho Co., Inc., Idaho Falls.
Wet Deposition Processes for Radioiodines.
Technical rept. Oct 81-Mar 82,
J. H. Keller, L. G. Hoffman, and P. G. Voilleque. Aug 82, 70p ENICO-1111
Prepared in cooperation with Science Applications, Inc., Idaho Falls, ID.

The results of a review of wet deposition processes for radioiodines are presented. Experimental measurements have shown that precipitation scavenging can be an important process for removal of radioiodines released to the atmosphere. Measurements of radioiodine species in routine gaseous effluents have shown that the distribution depends upon the type of nuclear facility considered. Because of differences in radioiodine species, observed scavenging rates for radioiodine in fallout are not generally applicable to routine releases from nuclear facilities. Adequate models are available to estimate the air to surface transport by wet processes. At the present time, the need is for more information on the rate constants used in the models. Reactor accident consequence calculations that assume no behavior differences among iodine species indicate that about half the predicted early deaths and illnesses are attributable to radioiodines. The distribution of species released under accident conditions will depend upon the actual sequence of events. However, for many scenarios the wet deposition of radioiodines will have an important bearing on the consequences.

NUREG/CR-2617 PC **A09**/MF **A01**
Brookhaven National Lab., Upton, NY.
Properties of Radioactive Wastes and Waste Containers.
Status rept. Oct 80-Sep 81,
Nabil Morcos, Ramesh Dayal, and Allen J. Weiss. Apr 82, 186p BNL-NUREG-51515
Contract DE-AC02-76CH00016
See also NUREG/CR-1326.

The objectives of this research program at BNL are to provide a technical basis that will assist the NRC's capability to predict low-level waste isolation performance, and to establish regulatory criteria. To meet these objectives, the work undertaken in this program was directed at characterizing low-level waste forms, their behavior and their performance. Research performed during the 1981 fiscal year is summarized. Topics discussed include the following: Leachability and compressive strength of boric acid waste in Portland III cement; Dispersion of (137)Cs, (85)Sr, and (60)Co from cement/organic ion exchange resin composites and from organic ion exchange resin/cement mixes; Leachability of bitumen/organic ion exchange resin composites; Correlation of (137)Cs leachability from small-scale (laboratory) samples to large-scale waste forms; Hydrostatic testing of 55-gallon carbon steel drums.

NUREG/CR-2731 PC **A03**/MF **A01**
Exxon Nuclear Idaho Co., Inc., Idaho Falls.
An Evaluation of the Safety Aspects of the Design and Operation of Temporary/Mobile Radioactive Waste Solidification Systems.
Formal technical rept. 1980-82,
F. N. McDonald, and L. W. McClure. Aug 82, 47p

An evaluation of the safety aspects of the design and operation of temporary/mobile radioactive waste solidification systems in use at commercial nuclear power reactors was completed. The study was undertaken in response to a General Accounting Office report issued in August 1978, calling for 'more regulatory oversight of commercial low-level radioactive waste treatment'. After reviewing the design and operation of three different vendor-operated waste solidification systems, it is clear that there are areas in which

the vendors can improve their services. However, the vendors generally do a good job of solidifying waste in a manner that is well controlled and safe.

N82-30070/8 PC **A04**/MF **A01**
Atomic Energy of Canada Ltd., Pinawa (Manitoba).
SYVAC: A Computer Program for Assessment of Nuclear Fuel Waste Management Systems Incorporating Parameter Variability.
K. W. Dormuth, and G. R. Sherman. Aug 81, 62p
DE82-902002, AECL-6814

This users' manual describes SYVAC, a computer program designed for use in post-closure assessment of risk associated with a nuclear fuel waste disposal system, taking into account variability and uncertainty in parameters defining the state of the disposal vault and its surroundings. Transport of radionuclides through a component of the system, such as a rock mass, is represented by a submodel that depends on system parameters. Several submodels are executed in sequence under the control of SYVAC to provide an estimate of the consequence associated with a given set of parameter values. Many such estimates are made, each time using a set of parameter values obtained by random sampling from distributions of specified type and range. The end result is a probability density function of consequence estimates together with detailed time-dependent information on all runs.

PB82-259698 PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Cleaning Up Nuclear Facilities--An Aggressive and Unified Federal Program Is Needed.
Report to the Congress.
25 May 82, 78p GAO/EMD-82-40

The Federal Government needs to take a more unified and aggressive approach to cleaning up and decommissioning nuclear facilities if the United States intends to effectively meet current and future decommissioning challenges. The limitations of current Federal agency decommissioning programs make it difficult to locate facilities in need of decommissioning actions and increase decommissioning costs not only for licensees but also for the public and the Federal Government. Until the Federal Government establishes a national decommissioning strategy and designates a lead agency responsible for monitoring implementation of that strategy, these problems will likely continue. More importantly, the chances of hazards to the public's health and safety will be increased because nuclear facilities may not be properly cleaned up.

18H. Radioactivity

DE82006863 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Impact of Source Terms on Distances to Which Reactor Accident Consequences Occur.
R. M. Ostmeyer. 1982, 12p SAND-82-0278C, CONF-820609-3
Contract AC04-76DP00789
American Nuclear Society annual meeting, Los Angeles, CA, USA, 6 Jun 1982.

Estimates of the distances over which reactor accident consequences might occur are important for development of siting criteria and for emergency response planning. This paper summarizes the results of a series of CRAC2 calculations performed to estimate these distances. Because of the current controversy concerning the magnitude of source terms for severe accidents, the impact of source term reductions upon distance estimates is also examined. (ERA citation 07:050467)

DE82013679 PC **A06**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Releases of Radioactivity at the Savannah River Plant, 1954-1980.
C. Ashley, C. C. Zeigler, and P. A. Culp. Jan 82, 120p DPSPU-81-25-1
Contract AC09-76SR00001
Portions of document are illegible.
Microfiche only after original copies are exhausted.

This report contains summaries of releases of radioactivity to onsite seepage basins and to plant effluents for each year since plant startup (1954 through 1980). Releases for the years 1954 through 1959 were reassessed in 1974 and assigned release values for specific long-lived radionuclides. These long-lived radionuclides (half-lives greater than 1 year) are the only radionuclides included for the years 1954 through 1970. Since 1970 all detectable radionuclides have been included. Measured migration o radionuclides from F-, H-, and K-Area seepage basins and desorption of exp 137 Cs from the Four Mile Creek stream bed are included in Summary B of this report. Summaries of monthly releases for 1979 and 1980 and total SRP releases by radionuclide in three categories: liquid to seepage basins, liquid to streams, and atmospheric are also included. Monthly releases for 1979 are included because the 1979 issue of this report was not published. All 1979 data are included in this report.

DE82014904 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Environmental Surveillance at Hanford for CY-1981.
M. J. Sula, W. D. McCormack, R. L. Dirkes, K. R. Price, and P. A. Eddy. May 82, 87p PNL-4211
Contract AC06-76RL01830

Environmental surveillance activities performed by the Pacific Northwest Laboratory for 1981 are discussed. The results are summarized as follows: Radionuclide concentrations and radiation dose measurements were below applicable concentration guides and radiation dose standards. There was no difference detected between airborne radionuclide concentrations in samples collected near to and far from the Hanford Site. A difference in exp 129 I concentration in Columbia River water downstream compared to upstream was observed. Strontium-90 concentrations downstream remained similar to past years while reduced concentrations were observed in the upstream samples. In addition, exp 60 Co and exp 131 I were observed more frequently in the downstream river water samples than in the upstream samples. In all cases, the downstream radionuclide concentrations were small in comparison to DOE radionuclide concentration guides and state and EPA drinking water standards. Low concentrations of radionuclides attributed to operations were observed in wildlife collected onsite. Low concentrations of fallout radionuclides from worldwide atmospheric nuclear testing were observed in foodstuffs and in soil and vegetation; there was no indication of a Hanford contribution to radionuclide levels. The highest penetrating dose rates were in the vicinities of the 100N and 300 Areas. Dose rates at both locations resulted from the presence, within the operating areas, of contained radioactive materials. Nonradiological water quality parameters were all within State Water Quality Standards for the Columbia River. The maximum 50-year whole body dose commitment to an individual from effluents released in 1981 was calculated to be 0.4 mrem. The maximum 50-year dose to a single organ, considering all pathways was approximately 1.3 mrem to the bone, primarily due to exp 90 Sr in the Columbia River.

DE82015886 PC **A08**/MF **A01**
Los Alamos National Lab., NM.
Environmental Surveillance at Los Alamos During 1981.
Apr 82, 173p LA-9349-ENV
Contract W-7405-ENG-36
Portions of document are illegible.
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This report documents the environmental surveillance program conducted by the Los Alamos National Laboratory during 1981. Routine monitoring for radiation and radioactive or chemical substances is conducted on the Laboratory site and in the surrounding region to determine compliance with appropriate standards and permit early identification of possible undesirable trends. Results and interpretation of data for 1981 are included on penetrating radiation; on the chemical and radiochemical quality of ambient air, surface and ground water, municipal water supply, soil and sediments, and food; and on the quantities of airborne emissions and liquid effluents. Comparisons with appropriate standards and regulations or with background levels from natural or other non-Laboratory sources provide a basis for concluding that environmental effects attributable to Laboratory operations are insignificant and are not considered hazardous to the population of the area. Results of several special studies describe some unique environmental conditions in the Laboratory environs. (ERA citation 07:048024)

DE82903048 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.
Radioactive Releases from Nuclear Power Stations: Status and Perspectives. Part I. Boiling-Water Reactors.
M. Laraia. Aug 81, 25p CNEN-RT/DISP-(81)6
In Italian.Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

This paper deals with BWR airborne effluent trend, as a result of offgas treatment system evolution and better fuel performance. Further radioactive discharge reductions are discussed. An introductory section is devoted to the applicability and meaningfulness of discharge data. (ERA citation 07:046850)

DE82903266 PC **A03**/MF **A01**
National Inst. of Radiological Sciences, Chiba (Japan).
Radioactivity Survey Data in Japan. No. 57.
Jun 81, 36p NIRS-RSD-57
Portions of document are illegible.
U.S. Sales Only.

Survey data is presented for air, water, soil and food chain radioactivity. (ERA citation 07:048050)

DE82903608 MF **A01**
Tennessee Valley Authority, Chattanooga. Div. of Occupational Health and Safety.
Environmental Radioactivity Levels, Sequoyah Nuclear Plant. Annual Report, 1981.
Apr 82, 60p TVA/OMS/OHS-82/8
Portions of document are illegible.
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The preoperational environmental monitoring program established a baseline of data on the distribution of natural and manmade radioactivity in the environment near the plant site. However, seasonal, yearly, and random variations in the data were observed. In order to determine the potential increases in environmental radioactivity levels caused by the plant, comparisons were made between data for indicator stations (those near the plant) and control stations (those remote from the plant) in conjunction with comparisons with preoperational data. TVA's Radioanalytical Laboratories participate in the Environmental Radioactivity Laboratory Intercomparison Studies Program conducted by EPA-Las Vegas. This program provides periodic crosscheck samples of the type and radionuclide composition normally analyzed in an environmental monitoring program. Routine sample handling and analysis procedures were employed in the evaluation of these samples. The results received during calendar year 1981 are shown. The +- 3sigma limits based on one measurement were divided by the square root of 3 to correct for triplicate determinations.

DE82903609 MF **A01**
Tennessee Valley Authority, Chattanooga. Div. of Occupational Health and Safety.
Environmental Radioactivity Levels, Browns Ferry Nuclear Plant. Annual Report, 1981.
Apr 82, 54p TVA/OMS/OHS-82/7
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The preoperational environmental monitoring program established a baseline of data on the distribution of natural and manmade radioactivity in the environment near the plant site. However, seasonal, yearly, and random variations in the data were observed. In order to determine the potential increases in environmental radioactivity levels caused by the plant, comparisons were made between data for indicator stations (those near the plant) and control stations (those remote from the plant) in conjunction with comparisons with preoperational data. TVA's Radioanalytical Laboratories participate in the Environmental Radioactivity Laboratory Intercomparison Studies Program conducted by EPA-Las Vegas. This program provides periodic crosscheck samples of the type and radionuclide composition normally analyzed in an environmental monitoring program. Routine sample handling and analysis procedures were employed in the evaluation of these samples. The EARL began processing samples in May 1980. The results received during calendar year 1981

are shown. The +- 3sigma limits based on one measurement were divided by the square root of 3 to correct for triplicate determinations.

PB82-258930 PC **A04**/MF **A01**
Conference of Radiation Control Program Directors, Inc.
A Survey of Radon Measurement Needs and Activities in State Radiation Control Programs.
Jul 82, 54p NBS-GCR-82-394
Contract NB80-NAHA-1046

This report summarizes the findings of a survey which was conducted in April-May, 1981 to determine radon measurement needs and present activities in state radiation control programs. The survey focuses on a wide variety of methods for measurements of radon and related quantities. This includes methods for measurement of radon (222Rn) concentration in air, potential alpha energy concentration, individual radon progeny concentrations, radon exhalation or flux density from surfaces, radon concentration in water, and thoron (220Rn) or thoron progeny concentrations in air. The report identifies the sources of radon and thoron which necessitate measurements in the states; the types of measurements and measurement methods that are performed routinely, or that the states would like to obtain or improve the capability of performing; existing calibration capabilities for these measurement methods; and the perceived needs for improving the quality of the measurements.

18I. Reactor Engineering and Operation

DE82005795 MF **A01**
Sandia National Labs., Albuquerque, NM.
LWR Core Meltdown Accident Sequence Phenomenology.
P. Cybulskis, R. Wooton, and G. J. Kolb. 1982, 10p SAND-82-0265C, CONF-820609-4
Contract AC04-76DP00789
American Nuclear Society annual meeting, Los Angeles, CA, USA, 6 Jun 1982, Portions of document are illegible.
Available in microfiche only.

The Reactor Safety Study Methodology Applications Program (RSSMAP) conducted risk analyses of four light water reactors. The plants studied were each designed by a different US reactor vendor and are enclosed within three different containment types. These plants were chosen because they are significantly different from those analyzed in the Reactor Safety Study (RSS). One of the products of the RSSMAP was a characterization of the physical processes associated with a variety of core melt accidents. This paper summarizes the results of the core meltdown analysis and outlines how they can be integrated into the analysis of a similar plant. Risk analyses of plants, which are similar to the four RSSMAP plants, are expected in the future as part of several NRC and industry sponsored programs. (ERA citation 07:054027)

DE82006300 MF **A01**
Sandia National Labs., Albuquerque, NM.
Total Vapor Pressure Measurements on Nuclear Fuels Using Fission Heating.
K. O. Reil, W. Breitung, and K. K. Murata. 1982, 9p SAND-82-0063C, CONF-820608-1
Contract AC04-76DP00789
Symposium on thermophysical properties, Gaithersburg, MD, USA, 15 Jun 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Total vapor pressure data of nuclear fuels at temperatures up to and above 5000 K are required for the analysis of Hypothetical Core Disruptive Accidents (HCDA) and for interpretation of related reactor safety experiments. Only transient (non-isothermal) measurements are feasible at such extreme temperatures. A technique, which was first applied in 1977 at Sandia National laboratories, utilizes pulse fission heating of the nuclear fuel for about 10 ms with measurements of the transient pressure developed in the test capsule. This paper describes the recent developments in experiment design as well as data analysis. The experimental improvements are mainly concerned with: a new pressure cell configuration; design of a calorimeter for the reactor environment; development of a rigorously clean test preparation procedure for contamination control; determination of quantity and composition of noncondensables in the pressure cell following experiment; and improved data acquisition. (ERA citation 07:054023)

DE82006850 PC **A02**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Impact of Reductions in Source Term Magnitudes on Reactor Accident Consequences.
D. J. Alpert. 1982, 6p SAND-82-0268C, CONF-820609-2
Contract AC04-76DP00789
American Nuclear Society annual meeting, Los Angeles, CA, USA, 6 Jun 1982.

Recently, NRC sponsored an evaluation of the technical basis for reactor accident source terms. The accident spectrum was divided into five groups, ranging from a full core-melt with uncontrolled release to a gap release with minimal leakage. For the purpose of decision making in such areas as siting and emergency response, NRC also defined a corresponding set of five generic LWR source terms, denoted SST1-5. A series of CRAC2 calculations has been made using these source terms. Consequence magnitudes for source terms SST1-5 were calculated and impact of source-term reductions on these magnitudes was examined. (ERA citation 07:054028)

DE82007743 PC **A05**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.
Turbulent Sweeping Flow-Mixing Model for Wire-Wrapped LMFBR Assemblies.
Y. N. Chan, and N. Todreas. Dec 80, 95p DOE/ET/37240-T3-Rev.2, COO-2245-55TR-Rev.2
Contract AS02-76ET37240
Portions of document are illegible.

A physical model is proposed to derive the sweeping flow for LMFBR triangular array wire-wrapped assemblies under the turbulent flow condition. Two correlations are suggested for the sweeping flow through two different types of gaps between subchannels, the gap between the interior subchannels and the gap between the wall subchannels. These two sweeping flow correlations are evolved by calibrating the constants in the proposed model against the available experimental data. Agreement between the correlations and all the experimental data to +-35% is obtained over the assembly design range of 1.315 greater than or equal to P/D greater than or equal to 1.067 and 52 greater than or equal to H/D greater than or equal to 4. Based on these correlations, flow sweeping input parameters for two popular computer codes, i.e., COBRA and SUPERENERGY, are recommended.

DE82013547 MF **A01**
Wisconsin Univ.-Milwaukee. Dept. of Mechanical Engineering.
Attenuation of Radiological Consequences from CDA'S by Radiative Heat Transfer. Final Report, October 1, 1976-March 31, 1980.
S. H. Chan. Jun 80, 18p DOE/ET/37227-8
Contract AS02-76ET37227
Portions of document are illegible.
Available in microfiche only.

The scope of the research is to investigate the general role of radiation heat transfer in attenuating the radiological consequences from core disruptive accidents of a liquid metal fast breeder reactor. Several major tasks were completed. They comprise first of all the analysis of radiative cooling in attenuating the fuel vapor in a HCDA bubble submerged in a sodium pool, and secondly the analysis of the HCDA work potential attenuation by heat losses, predominately the radiative transfer, to upper core blanket and gas plenum structures Thirdly, a general method was developed and analysis presented to evaluate radiative transfer from a high temperature condensable mixture. Also the effect of non-equilibrium mass transfer in such a high temperature mixture pertained to HCDA bubble has been assessed. Finally, the information on thermal radiation properties (absorption and reflection) of reactor materials, that are needed for radiative heat transfer calculations in accident analyses, is presented. (ERA citation 07:043609)

DE82013657 PC **A04**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Engineering Div.
Flow-Induced Vibration for Light Water Reactors. Progress Report, October 1980-December 1980.
M. R. Torres. Sep 81, 73p DOE/ET/34209-18, GEAP-24369
Contract AC02-77ET34209

Flow-Induced Vibration for Light Water Reactors (FIV for LWRs) is a four-year program designed to improve the FIV performance of light water reactors through the development of design criteria, analytical models for predicting behavior of components, general scaling laws to improve the accuracy of reduced-scale tests, and the identification of high FIV risk areas. The program is managed by the General Electric Nuclear Power Systems Engineering Department and has three major contributors: General Electric Nuclear Power Systems Engineering Department (NPSED), General Electric Corporate Research and Development (CR and D) and Argonne National Laboratory (ANL). The program commenced December 1, 1976. This progress report summarizes the accomplishments achieved during the period from October 1980 to December 1980. (ERA citation 07:043319)

DE82013661 MF **A01**
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
Optimization of the Axial Power Shape in Pressurized Water Reactors.
M. A. Malik, A. Kamal, M. J. Driscoll, and D. D. Lanning. Nov 81, 118p MIT-EL-81-037, MITNE-247
Contract AC02-79ET34022
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Analytical and numerical methods have been applied to find the optimum axial power profile in a PWR with respect to uranium utilization. The preferred shape was found to have a large central region of uniform power density, with a roughly cosinusoidal profile near the ends of the assembly. Reactivity and fissile enrichment distributions which yield the optimum profile were determined, and a 3-region design was developed which gives essentially the same power profile as the continuously varying optimum composition. State of the art computational methods, LEOPARD and PDQ-7, were used to evaluate the beginning-of-life and burnup history behavior of a series of three-zone assembly designs, all of which had a large central zone followed by a shorter region of higher enrichment, and with a still thinner blanket of depleted uranium fuel pellets at the outer periphery. (ERA citation 07:043382)

DE82013702 PC **A03**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Engineering Div.
Fluidelastic Response of a Tube in Eccentric Annular Flows.
W. H. Lin, M. W. Wambsganss, J. A. Jendrzejczyk, and T. M. Mulcahy. Nov 81, 33p DOE/ET/34209-21, GEAP-24382
Contract AC02-77ET34209

Experimental measurements are reported on the dynamic response of a circular cylindrical tube located concentrically and eccentrically in a circular water-flow channel. Acceleration components in two perpendicular directions are measured at the midpoint of the test element using a pair of accelerometers. The investigation includes determinations of natural frequencies, damping factors, and rms displacements, and the variations of the above dynamic quantities with eccentricity and mean axial flow velocity. The experimental data are processed into statistical forms, including power spectral density function and root-mean-square values. The results show the following: (1) the natural frequency of the tube shifts as the eccentricity or flow velocity increases, (2) the damping in flowing water is greater than that in stationary water and increases with increasing flow velocity and eccentricity, and (3) the rms displacement increases as the eccentricity and/or flow velocity increases. (ERA citation 07:043321)

DE82013731 PC **A04**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Engineering Div.
Flow-Induced Vibration for Light Water Reactors. Progress Report, January 1981-March 1981.
M. R. Torres. Sep 81, 73p DOE/ET/34209-19
Contract AC02-77ET34209

Flow-Induced Vibration for Light Water Reactors (FIV for LWRs) is a four-year program designed to improve the FIV performance of light water reactors through the development of design criteria, analytical models

for predicting behavior of components, and general scaling laws to improve the accuracy of reduced-scale tests, and through the identification of high FIV risk areas. The program is managed by the General Electric Nuclear Power Systems Engineering Department and has three major contributors: General Electric Nuclear Power Systems Engineering Department (NPSED), General Electric Corporate Research and Development (CR and D) and Argonne National Laboratory (ANL). The program commenced December 1, 1976. This progress report summarizes the accomplishments achieved during the period from January 1981 to March 1981. (ERA citation 07:043320)

DE82013733 PC **A02**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Nondestructive Evaluation of the Oxidation and Strength of the Fort Saint Vrain HTGR Support Block.
G. L. Tingey, G. J. Posakony, W. C. Morgan, J. M. Prince, and R. W. Hill. Apr 82, 14p PNL-4203
Contract AC06-76RL01830

Non-destructive detection of changes in the strength of graphite support structures in a HTGR appears to be feasible using sonic velocity measurements where access for through transmission is possible. Therefore, future HTGR designs should consider providing such access. Where access is not available, strength changes can be correlated with oxidation profiles in the support member. These oxidation profiles can be determined non-destructively by a combination of eddy current measurements to detect near surface oxidation and sonic backscattering measurements designed to determine oxidation in depth. The Fort Saint Vrain reactor provides an operating reactor to test the applicability of the eddy current and sonic backscattering techniques for determination of oxidation in a support block. Furthermore, such tests in Fort Saint Vrain will supply base line data which will be useful in assuring an adequate strength of the support structure for the lifetime of the reactor. Equipment is, therefore, being developed for tests to be conducted during the next major refueling of the reactor.

DE82013734 PC **A03**/MF **A01**
Bettis Atomic Power Lab., West Mifflin, PA.
Technical Progress Report Shippingport Atomic Power Station (PWR) For the Period July 26, 1981 to January 25, 1982.
A. C. Davis. 1982, 43p WAPD-MRP-157
Contract AC11-76PN00014
Portions of document are illegible.
Microfiche only after original copies are exhausted.

The Shippingport Atomic Power Station was operated with the Light Water Breeder Reactor (LWBR) core primarily at high power levels (base load) until December 11, 1981, when a planned semiannual shutdown for testing and maintenance began. Station startup commenced January 17, 1982. High power operation was achieved on January 18, 1982, and continued through the end of the report period, when the LWBR core had achieved 24,689 EFPH. Several brief reductions in power and three brief station shutdowns occurred during this period. Maximum allowable thermal power continued to be 80% of 236.6 MW thermal with reactor coolant flow at 100%, coolant pressure at 1600 psig and average temperature at 521 exp 0 F. It has been decided that LWBR core power operation at the Shippingport Atomic Power Station will be terminated October 1, 1982.

DE82014188 PC **A02**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
FMEF/Experimental Capabilities.
C. A. Burgess, and V. R. Dronen. 19 Oct 81, 10p
HEDL-SA-2571, CONF-820406-9
Contract AC06-76FF02170
Topical meeting on fast, thermal and fusion reactor experiments, Salt Lake City, UT, USA, 12 Apr 1982, Portions of document are illegible.

The Fuels and Materials Examination Facility (FMEF), under construction at the Hanford site north of Richland, Washington, will be one of the most modern facilities offering irradiated fuels and materials examination capabilities and fuel fabrication development technologies. Scheduled for completion in 1984, the FMEF will provide examination capability for fuel assemblies, fuel pins and test pins irradiated in the FFTF. Various functions of the FMEF are described, with emphasis on experimental data-gathering capabilities in the facility's Nondestructive and Destructive examination cell complex. (ERA citation 07:043447)

DE82014386 PC **A06**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Fuel Performance Improvement Program. Fuel Performance Analysis of the HBWR IFA-517.1 Test Assembly.
M. E. Cunningham, K. H. Rising, and J. O. Barner. Mar 82, 103p DOE/ET/34215-22, PNL-4130
Contract AC06-76RL01830
U.S. Sales Only.

The objectives of the Fuel Performance Improvement Program are to demonstrate the improved fuel-cladding interaction resistance of annular-coated-pressurized and sphere-pac fuel rod designs (which are expected to provide an extended burnup capability) and to provide the technical support needed to design and license lead test assemblies of these concepts for commercial irradiation in light water reactors. Under this program, one pellet (reference) and three sphere-pac fuel rods were irradiated in the instrumented test assembly IFA-517.1 in the Halden Boiling Water Reactor, Halden, Norway. These rods were irradiated frm April 1979 to January 1980 to a peak burnup of 7.0 MWd/kgM. This report presents fuel temperature, rod elongation, and internal rod pressure data from the irradiation of IFA-517.1 and an evaluation of these data, including an empirical correlation for the effective thermal conductivity of UO sub 2 sphere-pac fuel. (ERA citation 07:043323)

DE82014648 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Fatigue Growth of Non Self-Similar Surface and/or Embedded Cracks in Light Water Reactor Components.
G. C. Sih. Mar 82, 34p ALO-1009
Contract AC04-76DP00789

Sections III and XI of the ASME Boiler and Pressure Vessel Code, which provides guidance on the fatigue life of nuclear reactor components are reviewed. Limitations of the current design practice for estimating crack growth rates are pointed out and raise uncertainties on the establishment of design limits in view of recent experimental observations of fatigue crack growth behavior which differs from the assumptions made in the ASME Codes. Improvements on the underlying assumptions and analysis methods are suggested. The strain energy density criterion is presented as the basis for developing a design-by-analysis methodology to assess the fatigue life of components weakened by surface and embedded cracks. The proposed methodology has the capability to simulate the growth of fatigue cracks in a non self-similar fashion and at a non-uniform rate.

DE82700655 PC **A03**/MF **A01**
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
Gas Cooled Fast Breeder Reactors Using Mixed Carbide Fuel.
S. Kypreos. Sep 76, 39p EIR-304
U.S. Sales Only.

The fast reactors being developed at the present time use mixed oxide fuel, stainless-steel cladding and liquid sodium as coolant (LMFBR). Theoretical and experimental designing work has also been done in the field of gas-cooled fast breeder reactors. The more advanced carbide fuel offers greater potential for developing fuel systems with doubling times in the range of ten years. The thermohydraulic and physics performance of a GCFR utilising this fuel is assessed. One question to be answered is whether helium is an efficient coolant to be coupled with the carbide fuel while preserving its superior neutronic performance. Also, an assessment of the fuel cycle cost in comparison to oxide fuel is presented. (Atomindex citation 13:648301)

DE82700659 MF **A01**
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
Gas Cooled Fast Reactor Research and Development Program. Progress Report 1977.
G. Markoczy, M. Hudina, R. Richmond, P. Wydler, and R. W. Stratton. Mar 78, 44p EIR-335
U.S. Sales Only. Available in microfiche only.

The research and development work in the field of core thermal-hydraulics, experimental and analytical physics and carbide fuel development carried out 1978 for the Gas Cooled Fast Breeder Reactor at the Swiss Federal Institute for Reactor Research is described. (Atomindex citation 13:648305)

DE82700660 MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Obninsk. Fiziko-Energeticheskii Inst.
Calculating Random Temperature Fluctuations in a Reactor Core.
I. M. Kurbatov, and B. B. Tikhomirov. 1980, 40p FEI-1090
In Russian.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Experience accumulated in the course of elaborating calculation techniques of random temperature fluctuations in a core of fast reactor with a liquid metallic coolant is generalized. The calculational technique of random temperature fluctuations is described in conformity with the reactor stationary operation conditions. Classification of coolant heating factors is given. Characteristics of laws of probability distributions of fluctuations of determining parameters and some functions of these parameters are given. The influence of probability character of hot channel formation on heating factors values is considered. The two-dimensional character of the function of local factors distribution is taken into account. The method of heat leakage calculation of the hot channel with account for probability character of heat exchange conditions at the channel boundaries is described. The results of calculating the maximum temperature of shell of the BN-600 reactor more stressed fuel elements are given by way of example. (Atomindex citation 13:648308)

DE82701307 MF **A01**
Power Reactor and Nuclear Fuel Development Corp., Tokyo (Japan).
Summary of Power Ascension Test of Experimental Fast Reactor 'JOYO' MK-I.
H. Yamamoto, Y. Sekiguchi, and M. Hirose. Oct 80, 405p PNC-N-941-80-179
In Japanese.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

On April 24th, 1977, the initial criticality of JOYO was achieved and on July 5th, 1978, the reactor output reached rated power of 50 MW for the first time. The 75MW power ascension test was started in July, 1979, followed by two cycles of rated power operations, and the 100 hour nominal power continuous operation was completed in February, 1980. Through the tests for the core, plant it self, radiation shield and plant monitoring, the results proved satisfactory operation characteristics at 75MW. This report presents the summary of all the results obtained in the Test of MK-I core. (Atomindex citation 13:659829)

DE82701308 PC **A03**/MF **A01**
Power Reactor and Nuclear Fuel Development Corp., Tokyo (Japan).
Analytical Treatment of Large Leak Pressure Behavior in LMFBR Steam Generators.
M. Hori, and O. Miyake. Jul 80, 28p PNC-N-941-80-91
U.S. Sales Only.

Simplified analytical methods applicable to the estimation of initial pressure spike in case of a large leak accident in LMFBR steam generators were devised as follows; (i) Estimation of the initial water leak rate by the centered rarefaction wave method, (ii) Estimation of the initial pressure spike by the one-dimensional compressible method with either the columnar bubble growth model or the spherical bubble growth model. These methods were compared with relevant experimental data or other more elaborate analyses and validated to be usable in simple geometry and limited time span cases. Application of these methods to an actual steam generator case was explained and demonstrated. (Atomindex citation 13:659830)

DE82701539 PC **A04**/MF **A01**
CEA Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette (France). Div. d'Etude et de Developpement des Reacteurs.

Formalism for the Calculation of the Effect of Sodium Voiding on Neutron Leakages in Fast Reactor.
P. Benoist. Sep 81, 66p CEA-R-5121
In French.
U.S. Sales Only.

A simple formalism for the calculation of the effect of sodium voiding on neutron leakages in a fast reactor is presented. The diffusion coefficients in a plane or 2-D lattice are calculated following a method which is very analogous to the method proposed earlier by the author for the treatment of thermal reactors. The two situations, sodium present, sodium voided, are calculated with the same approximations. It is known that it is impossible, in the situation where the sodium is voided, to calculate buckling-independent diffusion coefficients, for they diverge these coefficients are hence calculated, in both situations, at the lowest order of the expansion in terms of the buckling, which introduces a logarithmic term. The calculation is performed in the actual geometry of the lattice, without cylindricalizing the cell. (Atomindex citation 13:662039)

DE82701541 PC **A02**/MF **A01**
UKAEA, Risley (England). Nuclear Power Development Establishment.
Theoretical Analysis of the Establishment of Natural Circulation in the Dounreay Prototype Fast Reactor.
C. W. Dawson. May 81, 20p ND-R-601(D)
U.S. Sales Only.

A digital computer code (BUNTY) is described which predicts the events following a loss of primary pumps in the Dounreay PFR. The code is compared with experiment and predictions for a full power trip are presented. Results are also given for two non-typical situations: boiling during natural circulation; and a loss of flow with failure to scram. (Atomindex citation 13:662091)

DE82701723 MF **A01**
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
Simple Theoretical Model for the Interpretation of Temperature and Void Fluctuations Caused by Inlet Coolant Velocity Noise.
T. Katona, and L. Mesko. Dec 81, 18p KFKI-1981-88
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The influence of the flow rate fluctuations upon the temperature noise has been investigated using a one fuel rod single channel reactor model. The development of the subcooled boiling phenomenon has been elaborated determining the influence of the temperature noise field upon the steam content fluctuations by means of the bubble condensation rate. The results derived for the temperature and void spectra are in accordance with the experimental expectations. (Atomindex citation 13:665531)

DE82750094 PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Neutronenphysik und Reaktortechnik.
Identification of Vibrational Effects in KNK II Fuel Elements.
W. Vaeth, F. Mitzel, and S. Ansari. Jun 81, 18p KFK-3157
U.S. Sales Only.

Several observations indicate vibrational effects in some fuel elements of the KNK-II core. This report describes how the coolant outlet temperature of each fuel element was used successfully as a means of the identification of these vibrations. As a result the cause of the sharp peaks in the power spectral density of the KNK-II reactivity noise was found. (ERA citation 07:043449)

DE82750095 MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Lab. fuer Aerosolphysik und Filtertechnik 1.
Simulation of the Transient Behavior of UO sub 2 - Pins by Means of Direct Electrical Heating.
Diss,
A. Alexas. Jul 81, 276p KFK-2658
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Using the theory and technology already known for operation under steady-state conditions, UO sub 2 -pins were exposed to electric power transients precalculable in quantitative terms and their behavior until failure was investigated. The VESUV computer code was developed in order to be able to formulate mathematically the physical processes taking place during the transient (above all the events leading to fuel pin failure). The sequence of three chains of accidents until fuel pin failure was simulated. The chains were selected from the whole spectrum of possible accidents characterized by a very low probability of occurrence and serious consequences. Simple correlations existing between the electric power and time-to-failure, time constant and time-to-failure, electric power at the time of failure and time-to-failure, electric power at the time of failure and time constant were derived from the experimental results. By comparison of the results with a number of experimental and theoretical results from nuclear accident analysis it was demonstrated that the derived correlations can be applied also to nuclear conditions after suitable modification. (ERA citation 07:043690)

DE82750096 PC **A02**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Lab. fuer Aerosolphysik und Filtertechnik 1.
Description of the Research Facility for Investigating Nuclear Aerosols (FAUNA).
J. Kind, and W. Lindner. Aug 81, 18p KFK-3011
In German.
U.S. Sales Only.

The development and consequences of large sodium fires have to be investigated within the framework of SNR safety research. The model theoretical analyses performed in this context must be validated by experiments. In the FAUNA research facility (Forschungsanlage zur Untersuchung nuklearer Aerosole) experiments are carried out refering to the sodium fire and aerosol behavior. Due to the size of the facility the range of extrapolation is substantially reduced between the experiment and practical SNR conditions. The technical design of the KfK/LAF built FAUNA facility are described. (ERA citation 07:043693)

DE82750103 MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Projekt Nukleare Sicherheit.
Nuclear Safety Project - Annual Report 1980.
Aug 81, 599p KFK-2950
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The Annual Report 1980 is a detailed description (in German language) of work within the Nuclear Safety Project performed in 1980 in the nuclear safety field by KfK institutes and departments and by external institutes on behalf of KfK. It includes for each individual research activity short summaries in English language on work completed, essential results, plans for the near future. (ERA citation 07:043692)

DE82750123 MF **A01**
GKSS - Forschungszentrum Geesthacht G.m.b.H., Geesthacht-Tesperhude (Germany, F.R.)
Application of the Subchannel Analysis Code COBRA III C for Liquid Sodium.
Diss,
K. L. Nissen. 1981, 106p GKSS-81/E/24
In German.
U.S. Sales Only. Available in microfiche only.

The subchannel-analysis code COBRA III C was developed to gain knowledge of mass flow and temperature distribution in rod bundles of light water reactors. A comparison of experimental results for the temperature distribution in a 19 rod bundle with calculations done by the computer program shows the capability of COBRA III C to handle liquid sodium cooling. The code needs sodium properties as well as changed correlations for turbulent mixing and heat transfer at the rod. (ERA citation 07:043445)

DE82903023 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per la Sicurezza Nucleare e la Protezione Sanitaria.
Seismic Risks for Nuclear Plants in Italy.
E. Iaccarino, T. Sano, and C. Zaffiro. Nov 80, 35p CNEN-RT/DISP-(80)3
In Italian.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This paper first examines the difficulties inherent in developing a probabilistic model for the evaluation of margins of risk relating to nuclear incidents produced by earthquakes. Then it considers the seismic and geologic problems pertaining to the determination of the design event, taking account of the particular situation in the country, in Italy. Finally the measures taken to minimise the uncertainties in risk evaluation are illustrated. The aim of the paper is therefore to check whether the contribution of seismic to total risk of a nuclear incident can be considered negligible for nuclear plants in Italy. (ERA citation 07:043601)

DE82903054 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Bologna (Italy). Dipartimento Reattori Veloci.
Calculations with SAGAPO-2 for a Gas-Cooled Bundle of 19 Rods with Triangular Roughness Ribs and Comparison with KFK Experimental Results.
A. Martelli, and G. Ottaviani. Nov 80, 108p CNEN-RT/ING-(80)24
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Thermo-fluiddynamic calculations were performed with the computer code SAGAPO-2 at a helium-cooled bundle of 19 rods with triangular roughness ribs. The data for the analysis were provided by the Institute of Neutron Physics and Reactor Engineering of the Karlsruhe Nuclear Center, where the experimental tests had been carried out. The calculations were performed in the frame of the Italian activities for the OECD-NEA Gas Cooled Fast Reactor Cooperative R and D Programme. This paper describes the main features of the theoretical analysis and presents comparisons between computed and experimental pressure drop and wall temperatures for two thermal tests with turbulent flow conditions. (ERA citation 07:046726)

DE82903058 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
Sensitivity Techniques for Data- and System-Oriented Adjustment Methods.
A. Gandini. 1981, 44p CNEN-RT/FI-81-12
U.S. Sales Only. Available in microfiche only.

After reviewing the various sensitivity methods for reactor analysis, data and system oriented adjustment methods are discussed. In particular, a development is suggested of the methodology proposed by Buckler for correlating channel power measurements in thermal reactors with lattice constants. (ERA citation 07:046800)

DE82903122 PC **A02**/MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Reattori Termici.
State-of-the-Art Review of Recent Advances in Nuclear-Reactor-Safety Studies.
M. Cumo, and A. Naviglio. Nov 80, 24p CNEN-RT/ING-(80)26
U.S. Sales Only.

Nuclear reactor thermal-hydraulics has turned, in recent years, its attention to transient phenomena strictly related to safety analysis. It is worthwhile to recall that the complexity of such studies is greatly enhanced, mainly due to a complete lack of informations in the scientific literature for industrial plants. The present survey aims at underlining the main points under investigation both in international and in Italian laboratories. (ERA citation 07:043602)

DE82903125 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
Applications of the COBRA-3C Code to LMFBR Calculations.
Sep 80, 51p CNEN-RT/FI-(80)17
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Results are presented of the calculations performed with the thermohydraulic subchannel code COBRA-3C, for out of pile experiments in LMFBR conditions, made at the CSN Casaccia. Necessary changes are

given to use the code in two-phase flow regime with Bankoff's void correlations. (ERA citation 07:043417)

DE82903128 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
Dynamics of Fast Reactors: 6) a Model for Calculation of the Temperature of the Fuel and Cladding by the Code NADYP-3.
F. Norelli. May 81, 49p CNEN-RT/FI-81-8
In Italian.Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Some numerical experiments are described which were performed by Pade and Chebichev numerical schemes for solving the non-linear heat conduction problems in a fuel pin and its cladding. The computer program, which will be included in the Fast Reactor Dynamics code NADYP-3, is described. (ERA citation 07:043419)

DE82903296 PC **A10**/MF **A01**
Bechtel Group, Inc., San Francisco, CA.
Guide to the Design of Secondary Systems and Their Components to Minimize Oxygen-Induced Corrosion. Final Report.
S. W. W. Shor, E. E. Hanson, R. L. Lessley, P. B. Lindsay, and J. Rios. Mar 82, 204p EPRI-NP-2294

Feedwater, condensate, and steam impurities are the most serious contributors to the corrosion process in the secondary system of pressurized water reactor (PWR) nuclear power plants. One important contaminant that contributes to the corrosion process is oxygen. This design guide discusses features that should be specified in components and designed into systems to minimize oxygen induced corrosion. Subjects discussed in this design guide are sources of air inleakage and its reduction, oxygen introduction from condensate storage tanks, the use of chemicals to scavenge oxygen and protect surfaces from oxygen induced corrosion, selection of materials resistant to oxygen induced damage, and methods of removing oxygen from condensate under low load conditions. (ERA citation 07:043371)

DE82903309 MF **A01**
Electric Power Research Inst., Palo Alto, CA.
Prevention of Condenser Failures: The State of the Art.
B. C. Syrett. Mar 82, 365p EPRI-RD-2282-SR, CONF-810170-, CONF--811191--
Conference on prevention of condenser failures-the state of the art, Palo Alto, CA, USA, 21 Jan 1981, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

An EPRI sponsored seminar on prevention of failures in steam surface condensers was held first in Palo Alto, California, on January 21-22, 1981, then again in Arlington, Virginia, on November 4-5, 1981. The objective of the seminar was to explain how condenser failures occur, where in the condenser they occur, and how the incidence of such failures is dependent on materials selection, condenser design, condenser operation, and environmental variables. Each mechanism of failure was discussed separately, and recommendations were made on how to avoid each type of problem and on what to do if such failures were already occurring. This volume comprises extended abstracts and visuals of the presentations made at the seminar. (ERA citation 07:043333)

NUREG/CR-1891 PC **A12**/MF **A01**
Ames Lab., IA.
Reliability Analysis of Containment Strength: Sequoyah and McGuire Ice Condenser Containments.
Technical rept. 1 Sep 79-30 Sep 80,
L. Greimann, F. Fanous, A. Sabri, D. Ketelaar, and A. Wolde-Tinsae. Aug 82, 268p IS-4753

The Sequoyah and McGuire ice condenser containment vessels were designed to withstand pressures in the range of 12 to 15 psi. Since pressures of the order of 28 psi were recorded during the Three Mile Island incident, a need exists to more accurately define the strength of these vessels. A best estimate and uncertainty assessment of the strength of the containments was performed by applying the second moment reliability method. Material and geometric properties were supplied by the plant owners. A uniform static internal pressure was assumed. Gross deformation was taken as the failure criterion. Both approximate and finite element analyses were performed on the axisymmetric containment structure and the penetrations.

NUREG/CR-2646 PC **A09**/MF **A01**
Sandia National Labs., Albuquerque, NM.
A Model for Boiling and Dryout in Particle Beds,
Ronald J. Lipinski. Jun 82, 181p SAND-82-0765
Contract DE-AC04-76DP00789

This report contains the development of a new model to describe boiling and dryout in particle beds as well as a description of the predictions of the model in various circumstances, comparison with published data, and a review of all recent work in the field. Because the report is lengthy, it is recommended that the summary be read first so that an overview of the report can be obtained. The Table of Contents may then be used to direct readers to areas of particular interest for more detail.

NUREG/CR-2826 PC **A15**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Experiment Data Report for LOFT Large Break Loss-of-Coolant Experiment L2-5,
Paul D. Bayless, and Janice M. Divine. Aug 82, 327p EGG-2210
Contract DE-AC07-76IDO1570

Selected pertinent and uninterpreted data from the third nuclear large break loss-of-coolant experiment conducted in the Loss-of-Fluid Test (LOFT) facility are presented. The LOFT facility is a 50-MW(t) pressurized water reactor (PWR) system with instruments that measure and provide data on the system thermal-hydraulic and nuclear conditions. The operation of the LOFT system is typical of large commercial PWR operations. Experiment L2-5 simulated a double-ended offset shear of a cold leg in the primary coolant system. The primary coolant pumps were tripped within 1 s after the break initiation, simulating a loss of site power. Consistent with the loss of power, the starting of the high- and low-pressure injection systems was delayed. The peak fuel rod cladding temperature achieved was 1078 + or - 13 K. The emergency core cooling system re-covered the core and quenched the cladding. No evidence of core damage was detected.

NUREG/CR-2834 PC **A09**/MF **A01**
Brookhaven National Lab., Upton, NY.
Independent Seismic Evaluation of the Diablo Canyon Unit 1 Containment Annulus Structure and Selected Piping Systems.
Technical rept.,
A. J. Philippacopoulos, M. Reich, P. Bezler, C. Miller, and Y. K. Wang. Aug 82, 178p BNL-NUREG-51566

An independent review and development of the vertical floor spectra for the Unit 1 containment annulus structure of the Diablo Canyon Power Plant was carried out using a detailed three-dimensional model. The developed floor spectra were then utilized for confirmatory evaluations of two selected piping systems. The latter were evaluated by the envelope response spectrum method, and by the independent support motion response spectrum method. ASME Class 2 evaluations of the two systems were also performed. Finally, a confirmatory evaluation was carried out for the model utilized by URS/Blume for the development of the vertical floor response spectra.

NUREG-0090-V5-N1 PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Report to Congress on Abnormal Occurrences, January - March 1982.
Quarterly rept.
Aug 82, 55p
See also NUREG-0090-V3-N4.

Section 208 of the Energy Reorganization Act of 1974 identifies an abnormal occurrence as an unscheduled incident or event which the Nuclear Regulatory Commission determines to be significant from the standpoint of public health or safety and requires a quarterly report of such events to be made to Congress. This report covers the period January 1 to March 31, 1982. During the report period, there were four abnormal occurrences at the nuclear power plants licensed to operate. The first involved diesel generator engine cooling system failures. The second involved pressure transients during shutdown. The third involved major deficiencies in management controls. The fourth involved a steam generator tube rupture. There were no abnormal occurrences for the other NRC licensees during the report period. The Agreement States reported no abnormal occurrences to the NRC.

NUREG-0304-V7-N2 PC **A08**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Administration.
Regulatory and Technical Reports: Compilation for Second Quarter 1982, April-June.
Aug 82, 155p
See also NUREG-0304-V7-N1.

This compilation lists all NRC regulatory and technical reports published under the series during the second quarter of 1982.

NUREG-0528-SUP-N3 PC **A03**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Safety Evaluation Report Related to the Operation of Wm. H. Zimmer Nuclear Power Station, Unit No. 1, Docket No. 50-358, Cincinnati Gas and Electric Company. Supplement Number 3.
Rept. for Nov 81-Aug 82.
Aug 82, 43p
Supplement to NUREG-0528.

The Safety Evaluation Report for the Zimmer Nuclear Power Station, Unit 1 was issued in January 1979. At the time of issuance there were two outstanding issues. Supplement No. 1, issued in June 1981 discussed the resolution of these issues and the concerns of the Advisory Committee on Reactor Safeguards, which issued a favorable report on March 13, 1979. Supplement No. 2, issued in October 1981 discussed subsequent outstanding issues since June 1981. This Supplement closes out outstanding issues and concludes that the facility can be operated by the applicant without endangering the health and safety of the public. The Zimmer Station is located in Washington Township, Clermont County, Ohio.

NUREG-0661-SUP-N1 PC **A02**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Safety Evaluation Report for the Mark I Containment Long-Term Program: Resolution of Generic Technical Activity A-7. Supplement Number 1.
Aug 82, 23p
Supplement to NUREG-0661.

NUREG-0661 was originally issued in July 1980 with four open items which have now been resolved. The four open items consisted of the downcomer oscillation load definition and the confirmatory analyses and test programs which were intended to justify the adequacy of the load specification. The confirmatory efforts concern the assessment of compressible flow effects in the scaled pool swell tests and the confirmation of condensation oscillation load magnitude and global symmetry. The staff has reviewed the improved downcomer condensation oscillation load definition provided by the Mark I Owners' Group and find it acceptable. The staff has also reviewed the confirmatory experimental and analytical programs conducted by the Mark I Owners' Group and have concluded that the adequacy of the various load specifications have been justified. This Supplement No. 1 to NUREG-0661 therefore serves as the staff's final resolution of Unresolved Safety Issue A-7.

NUREG-0748-V2-N7 PC **A16**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Operating Reactors Licensing Actions Summary.
Aug 82, 359p
See also NUREG-0748-V2-N6.

The Operating Reactors Licensing Actions Summary provides the management of the Nuclear Regulatory Commission (NRC) with an overview of licensing actions dealing with operating power and nonpower reactors.

NUREG-0881-SUP-N1 PC **A03**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Safety Evaluation Report Related to the Operation of Wolf Creek Generating Station, Unit No. 1, Docket No. STN-50-482, Kansas Gas and Electric Company, et al. Supplement Number 1.
Technical rept. Apr-Aug 82.

Aug 82, 33p
Supplement to NUREG-0881.

Supplement No. 1 to the Safety Evaluation Report related to operation of the Wolf Creek Generating Station, Unit No. 1 updates the information contained in the Safety Evaluation Report, dated April 1982. This supplement also addresses the ACRS Report issued May 11, 1982. The Safety Evaluation Report and its supplement pertain to the application for a license to operate the Wolf Creek Generating Station, Unit No. 1 filed by the Kansas Gas and Electric Company on February 19, 1980. The Construction Permit, CPPR-147 was issued on May 17, 1977. The facility is located in Coffey County, Kansas.

NUREG-0884 PC **A11**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Final Environmental Statement Related to the Operation of Perry Nuclear Power Plant, Units 1 and 2, Docket Nos. 50-440 and 50-441, Cleveland Electric Illuminating Company.
Aug 82, 238p

The information in this Final Environmental Statement is the second assessment of the environmental impact associated with the construction and operation of the Perry Nuclear Power Plant, Units 1 and 2, located on Lake Erie in Lake County, about 11 km (7 miles) northeast of Painesville, Ohio. Plant construction for Unit 1 is currently about 83% complete, and Unit 2 about 43% complete. Fuel loading for Units 1 and 2 currently estimated by the licensee (Cleveland Electric Illuminating Company) for November 1983, with Unit 2 fuel loading scheduled for May 1987. The present assessment is the result of the NRC staff review of the activities associated with the proposed operation of the plant.

NUREG-0892-SUP-N1 PC **A11**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Safety Evaluation Report Related to the Operation of WPPSS Nuclear Project No. 2. Docket No. 50-397, Washington Public Power Supply System. Supplement Number 1.
Aug 82, 243p
See also NUREG-0892.

Supplement No. 1 to the Safety Evaluation Report on the application filed by Washington Public Power Supply System for a license to operate the WPPSS Nuclear Project No. 2, located in Richland, Washington, has been prepared by the Office of Nuclear Reactor Regulation of the U.S. Nuclear Regulatory Commission. This supplement reports the status of certain items that had not been resolved at the time of publication of the Safety Evaluation Report.

NUREG-0932 PC **A22**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Technical Specifications, Virgil C. Summer Nuclear Station, Unit No. 1, Docket No. 50-395. Appendix 'A' to License No. NPF-12.
Aug 82, 515p

The Virgil C. Summer Nuclear Station, Unit No. 1 Technical Specifications were prepared by the U.S. Nuclear Regulatory Commission to set forth the limits, operating conditions and other requirements applicable to a nuclear reactor facility as set forth in Section 50.36 of 10 CFR Part 50 for the protection of the health and safety of the public.

18J. Reactor Materials

DE82002724 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Source and Sink Flows for a Model Gas Centrifuge Equation Using Finite Elements.
M. H. Berger. Jun 81, 27p K/OA-5004, CONF-820702-1
Contract W-7405-ENG-26
International symposium on finite element methods in flow problems, Tokyo, Japan, 26 Jul 1982.

Gas flow internal to a high speed, rotating right circular cylinder may be described away from the ends by Onsager's pancake equation, which involves a potential with a sixth order differential operator in x and a second order partial derivative in y, where x is the scale height variable measured from the rotor wall and y is the dimensionless axial coordinate measured from the rotor end. A previously reported finite element algorithm is extended to obtain a numerical hydrodynamics solution for a point source or sink drive in the long bowl limit. Finite element solutions for sources both low and high in the atmosphere are confirmed by comparison with a new analytical solution to this model centrifuge problem. Also an interesting flow profile is found for an intermediate height source.

DE82007087 PC **A02**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Program for Comparing Multi-Attributed Values and Impacts.
R. G. Clark, D. W. Fraley, P. T. Reardon, and H. V. Tovmassian. 1980, 7p PNL-SA-8460, CONF-800655-36
Contract AC06-76RL01830
21. annual meeting of the Institute of Nuclear Materials Management, Palm Beach, FL, USA, 30 Jun 1980, Portions of document are illegible.

An improved method of performing value-impact analyses was developed for the US Nuclear Regulatory Commission in their continuing effort to regulate improvements in material control and accounting programs. The method is used to more objectively compare multi-attributed criteria such as dollars and reduced risks. The method is described for an application which assesses improvements in independent verification of waste discards. A savings in time and an in-depth participation by several analysts is achievable using the computer program developed for this purpose.

DE82008070 PC **A06**/MF **A01**
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
X-Ray-Fluorescence and BOB-Displacer-System Design Specification for Application in the Wet Scrap Design Laboratory. Final Report for GFY 1980.
D. R. Jedlovec. Sep 80, 119p DOE/SF/71031-T34, XL-895-00459-2
Contract AT03-76SF71031

In support of the accountability and process control measurement needs of the Wet Scrap Design Lab (WSDL), experimental bases have been generated for the application of bob displacement and x-ray fluorescence (XRF) liquid measurement techniques. Experimental results are described herein along with design specifications for implementation of these techniques at the WSDL. For bob displacement system testing, the performance of a prototype rig during static and dynamic modes of operation, including the effects of tank transfers, mixing, and simulated boiling, has been evaluated. X-ray fluorescence analysis of uranium and plutonium solutions representative of those expected from the wet chemical processes of the WSDL has been performed. (ERA citation 07:046037)

DE82008287 MF **A01**
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
Description of X-Ray-Fluorescence (XRF) System for the Wet Scrap Development Laboratory (WSDL).
D. R. Jedlovec. Jun 81, 27p DOE/SF/71031-T37
Contract AT03-76SF71031
Portions of document are illegible.
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In support of the process control and accountability needs of the Wet Scrap Design Laboratory (WSDL), a technique utilizing X-ray Fluorescence (XRF) to determine actinide concentrations was developed and tested in FY 80, FY 81 at the General Electric Vallecitos Nuclear Center (GE-VNC). XRF analysis of uranium and plutonium solutions representative of those expected from the wet chemical processes of the WSDL was performed. This contract was to develop, test, and demonstrate control system concepts to provide a basis for an Integrated Control System (ICS) for a COPRECAL Conversion Plant. Financial support to the ICS was withdrawn before any x-ray fluorescence plutonium testing and development work could be accomplished. The following XRF testing and operation were performed at GE-VNC in FY 80, FY 81: uranium, plutonium, U/Pu testing completed September 1980; in-line testing completed October 1980; high concentration testing completed October 1980; shipment of XRF system components to W-HEDL accomplished January 1981. (ERA citation 07:046038)

DE82008767 PC **A03**/MF **A01**
Exxon Nuclear Co., Inc., Richland, WA.
Sphere-Pac Fuel Development Program. Semi-Annual Progress Report, April 1981-September 1981.
D. C. Kilian, S. S. Koegler, and L. D. Gerrald. Jan 82, 46p DOE/ET/34026-4
Contract AC06-79ET34026
Portions of document are illegible.
U.S. Sales Only. Microfiche only after original copies are exhausted.

Progress made by Exxon Nuclear Company, Inc. toward developing processes for fabricating spherical particle (sphere-pac) nuclear fuel is reported for the period April 1981 through September 1981. The objective of the program is to convert a series of batch laboratory operations developed at Oak Ridge National Laboratory into a continuous process suitable for commercial application. The program has moved through the phases of technology review, pilot plant construction, testing of unit operations and equipment development. Activities during the reporting period have concentrated on defining the process parameters and equipment designs necessary for continuous, high quality sphere production. Systematic variation of process parameters has shown that a fairly broad operating region exists for producing high quality, large and medium size UO sub 2 spheres.

DE82014200 MF **A01**
Oak Ridge National Lab., TN.
Radiolytic and Chemical Transformation of Solvents Used in Nuclear-Fuel Reprocessing.
Z. Nowak. 1981, 142p ORNL-tr-4822
Contract W-7405-ENG-26
C INR-1557/XVII/C/B, 1975.Portions of document are illegible.
Available in microfiche only.

Extractant-diluent systems used in the Purex process were degraded radiolytically to study the influence of radiolytic and chemical changes on the extractive properties of the systems studied. The radiolytic degradation of TBP diluent-nitric acid systems was studied by means of gas chromatography, thin-layer radiochromatography, ir and uv spectra and paramagnetic resonance methods. The influence of the dose rate, the nature of the TBP diluent and the nitric acid concentration on the extraction of uranium, and the retention of uranium and zirconium by degraded Purex solvents were established. The radiolysis of the systems studied was compared with thermal degradation, and the main differences between the two processes are demonstrated. The fact that present methods of scrubbing solvents are not effective for heavily degraded solvents is established.

DE82014600 PC **A05**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Engineering Div.
BWR Extended Burnup.
G. C. Hopkins. Aug 81, 77p GEAP-25460
Contract AT03-76SF77011
U.S. Sales Only.

Extended burnup fuel for the Boiling Water Reactor (BWR) was evaluated as part of the DOE/TVA/GE Phase I Improved Uranium Utilization (IUU) Program. Combinations of four alternatives to extent fuel burnup were evaluated: increased enrichment, reduced gadolinia residual, and spectral shift via flow control and burnup shape optimization. The evaluations were focused on a selected operating reference reactor, the TVA Browns Ferry-3 station. The primary objectives of the evaluations were to determine to what extent the extended burnup alternatives could be used to reduce BWR uranium and separative work requirements, to increase discharge burnup, to increase refueling cycle length, to improve the capacity factor, and to decrease fuel cycle cost. The impact of these alternatives on overall reactor performance also was evaluated. (ERA citation 07:043479)

DE82014601 PC **A05**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Engineering Div.
Reconstitution and Reinsertion of BWR High Enrichment Discharge Fuel Rods.
G. C. Hopkins. Aug 81, 98p GEAP-25461

Contract AT03-76SF77011
U.S. Sales Only.

Reconstitution and reinsertion of high enrichment discharge fuel rods in a boiling water reactor (BWR) was evaluated as part of the DOE/TVA/GE Phase I Improved Uranium Utilization (IUU) Program. Fuel bundle reconstitution involves the reassembly and reinsertion of selected fuel rods from discharge fuel assemblies. The rods selected for reinsertion are those with relatively high residual fissile content. The reconstituted fuel bundles are reinserted into the reactor for further irradiation. Evaluations of this concept focused on a selected operating reference reactor, the TVA Browns Ferry-3 station. Reconstitution and reinsertion of high enrichment discharge fuel rods were evaluated relative to three different reference designs, two of which applied other fuel cycle improvement alternatives. The primary objectives of the evaluations were to determine to what extent fuel bundle reconstitution could be used to reduce BWR) uranium and separative work requirements, and to decrease fuel cycle costs. The impact of fuel bundle reconstitution on overall reactor performance also was evaluated. (ERA citation 07:043480)

DE82015756 PC **A04**/MF **A01**
Battelle Project Management Div., Columbus, OH. Office of Nuclear Waste Isolation.
Convective Heat Transfer within Spent Fuel Canisters: An Experimental Laboratory Study.
M. Keyhani, F. A. KUlacki, and R. N. Christensen.
Jan 81, 73p ONWI-229
Contract AC06-76RL01830

Heat transfer correlations are developed for a vertical annulus wherein the inner cylinder is electrically heated at a rate scaled tothat expected in a typical pressurized or boiling water reactor subassembly. The outer cylinder is maintained at a constant temperature and provisions have been made in the design of the apparatus for future experiments with multiple rod arrays having a specific power genation similarily scaled to that in a fuel rod subassembly. Overall heat transfer data are corrected for thermal radiation in the annulus; and Rayleigh numbers, based on the gap width, span the conduction, transitio and turbulent regimes of free convection. A total heat transfer coefficient is also obtained for each run via lineraization of the radiative transport across the annulus. Heat transfer coefficients are obtained with air and helium as the fill media. The range or Rayleigh numbers for the present data is 300 < Ra < 2.3 x 10 exp 6 . Generally, the energy transferred by radiation across the annulus, as a fraction of total heat transfer, varies with Rayleigh number and fill medium. With air as the fill medium, thermal radiation can account for more than 40% of the heat transfer. With helium, radiation can account for up to one-third of the heat transfer rate. The results of the present work establish a baseline of comparison of het transfer coefficients to be obtained with a multiple rod array and for the assessment of the effects of thermal radiation on heat transfer in a fuel rod bundle.

DE82700658 MF **A01**
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
Fast Reactors Using Molten Chloride Salts as Fuel. Final Report (1972-1977).
M. Taube. Jan 78, 210p EIR-332
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This report deals with a rather exotic 'paper reactor', in which the fuel is in the form of molten chlorides. (a) Fast breeder reactor with a mixed fuel cycle of thorium/uranium-233 and uranium 238/plutonium in which all of the plutonium can be burned in situ and in which a denatured mixture of uranium-233 and uranium-238 is used to supply further reactors. The breeding ratio is relatively high, 1.58 and the specific power is 0.75 GW(th)/m exp 3 of core. (b) Fast breeder reactor with two and three zones (internal fertile zone, intermediate fuel zone, external fertile zone) with an extremely high breeding ratio of 1.75 and a specific power of 1.1 GW(th)/m exp 3 of core. (c) Extremely high flux reactor for the transmutation of the fission products: strontium-90 and caesium-137. The efficiency of transmutation is approximately 15 times greater than the spontaneous beta decay. This high flux burner reactor is intended as part of a complex breeder/burner system. (d) Internally cooled fast breeder in which the cooling agent is the molten fertile material, the same as in the blanket zone. This reactor has a moderate breeding ratio of 1.38, a specific power of 0.22 GW(th)/m exp 3 of core and very good inherent safety properties. All of these reactors have the fuel in the form of molten chlorides: PuCl sub 3 as fissile, UCl sub 3 as fertile (if needed) and NaCl as dilutent. (Atomindex citation 13:648304)

DE82701306 MF **A01**
Japan Atomic Energy Research Inst., Tokyo.
Prepration of Uranium Carbide Pellets.
Y. Suzuki, T. Sasayama, Y. Arai, A. Maeta, and H. Watanabe. Mar 78, 40p JAERI-M-7601
In Japanese.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Uranium carbide pellets were prepared by carbothermic reduction of uranium oxide with graphite in gloveboxes of high-purity argon gas atmosphere. The gas atmosphere contained 3 ppM oxygen and 5 ppM water, which protected well the uranium carbide powder from oxidation. The pellets of single phase uranium monocarbide had theoretical density over 85% and contained 2000 to 3000 ppM oxygen. To obtain the pellets of stoichiometric uranium monocarbide, the suitable mixing ratio of uranium oxide and graphite is 2.950 to 2.975. The relation between atmosphere and reaction rate in carbothermic reduction was also examined. The reaction rate is lower in argon gas flow than in vacuum. Density of the sintered pellets is influenced by milling method and milling time. Other factors such as compacting pressure, binder quantity, and chemical composition have a little effect on the density. (Atomindex citation 13:659828)

DE82701724 MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Teoreticheskoi i Eksperimental'noi Fiziki.
Calculation of Burnup Fraction in the Three-Dimensional Polycell of a Heterogeneous Reaction. DIFUR Program.
V. M. Malofeev. 1981, 16p ITEF-74(1981)
In Russian.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Numerical solution scheme and a program for calculating the fuel burnup fraction distribution in a three-dimensional polycell of a heterogeneous reactor are presented. The program is intended for the calculation of burnup fraction in the reactor polycell operating in the regime of continuous fueling as well as for modelling the fuel burnup process in the case of reactor fueling, performed at large time intervals. A spatial distribution is described with three-dimensional equations of the heterogeneous theory. Calculational results for fuel burnup fraction distributions in the three-dimensional polycell of a heavy water cooled reactor operating in the regime of continuous fueling are given as an example. (Atomindex citation 13:665549)

DE82750100 MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.).
Thermalhydraulic Experiments with a Cluster of 19 Rods Roughened by a Novel Type of Roughness.
K. Rehme. Feb 81, 329p KFK-3102
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Distributions of temperature and pressure were measured on cluster of 19 electrically heated tubes. 400 thermocouples were used for temperature measurements. The tubes were partly roughened by a novel type of roughness with a thermal performance superior to that of transverse ribs. The experiments both with helium and nitrogen as coolants covered a range of Reynolds numbers between 450 and 1.8 x 10 exp 5 . The maximum linear rod power achived was 43 kWm exp -1 , the maximum measured wall temperature 1271 K (998 exp 0 C). The report contains the description of the test section together with all tabulated results. (ERA citation 07:043533)

DE82750451 PC **A03**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Projekt Spaltstoffflusskontrolle.
Annual Report of the Nuclear Safeguards Project 1980.
H. R. Mache. Oct 81, 45p KFK-3169
In German.
U.S. Sales Only.

The present report describes the major activities carried out in 1980 in the framework of the Nuclear Safeguards Project by the Institutes of the Kernforschungszentrum Karlsruhe and the European Institute of Transuranium Elements. (ERA citation 07:049430)

DE82903107 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ciclo del Combustibile.
Criticality Assessment of a Processing Cell in a Reprocessing Plant.
A. Hall, and P. A. Landeyro. Sep 80, 12p CNEN-RT/ING-(80)19
In Italian.Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The present paper defines (as basic criteria r criticality assessment of a cell in a reprocessing plant) operational and accidental conditions greater than can actually occur and assesses safety by using the superficial density method, and MORSE and KENO IV Monte Carlo codes. The paper infers from criticality verifications made that the cell is safe, and highlights the soundness of the superficial density method in actual applications. (ERA citation 07:042434)

DE82903281 MF **A01**
Battelle Columbus Labs., OH.
Instability Predictions for Circumferentially Cracked Type-304 Stainless-Steel Pipes under Dynamic Loading. Final Report.
A. Zahoor, G. Wilkowski, I. Abou-Sayed, C. Marschall, and D. Broek. Apr 82, 59p EPRI-NP-2347-V.1
Portions of document are illegible.
Available in microfiche only.

This report provides methods to predict margins of safety for circumferentially cracked Type 304 stainless steel pipes subjected to applied bending loads. An integrated combination of experimentation and analysis research was pursued. Two types of experiments were performed: (1) laboratory-scale tests on center-cracked panels and bend specimens to establish the basic mechanical and fracture properties of Type 304 stainless steel, and (2) full-scale pipe fracture tests under quasi-static and dynamic loadings to assess the analysis procedures. Analyses were based upon the simple plastic collapse criterion, a J-estimation procedure, and elastic-plastic large-deformation finite element models.

DE82904048 MF **A01**
General Electric Co., San Jose, CA. Nuclear Energy Engineering Div.
BWR Control-Rod Cobalt-Alloy Replacement. Executive Summary.
P. Aldred. Mar 82, 35p EPRI-NP-2329-SY
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Cobalt base pin and roller alloys in BWR Control Rods are a source for the Co-60 isotope which contributes to radiation buildup in the BWR core, the recirculation piping system and the spent fuel pool. It thereby influences personnel radiation exposure during BWR plant maintenance. The program objectives were (a) to identify non-cobalt alloys which could potentially replace the cobalt alloys, (b) evaluate the alloys by testing to qualify them for in-reactor surveillance testing, and (c) to initiate reactor tests at 2 BWRs. Wear resistance, an important requirement for pins and rollers, was measured in a simulated BWR environment (excluding irradiation). Prototypic wear tests were emphasized and a prototype control rod drive test facility was used to evaluate several pin and roller alloy combinations during prototype control rod operation.

NUREG/CR-2757 PC **A04**/MF **A01**
EG and G Idaho, Inc., Idaho Falls.
Zircaloy Cladding Embrittlement Criteria: Comparison of In-Pile and Out-of-Pile Results,
Fahmy M. Haggag. Jul 82, 61p EGG-2123
Contract DE-AC07-76IDO1570

Zircaloy-4 cladding embrittlement data from both in-pile and out-of-pile experiments are compared and correlated with embrittlement criteria based on the fraction of the remaining beta phase, the extent of oxidation (equivalent cladding reacted), and the oxygen concentration in the beta phase. The in-pile data are from the Power-Cooling-Mismatch and Irradiation Effects Test Series performed in the Power Burst Facility reactor at the Idaho National Engineering Laboratory.

The out-of-pile data are from isothermal oxidation experiments conducted at Argonne National Laboratory on simulated fuel rods in high-temperature steam. The zircaloy embrittlement criteria most applicable to severe fuel damage conditions are indentified.

PB82-875162 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Spent Nuclear Fuel Recovery. May, 1972-September, 1982 (Citations from the NTIS Data Base).
Rept. for May 72-Sep 82.
Sep 82, 158p
Supersedes PB81-850687.

This bibliography contains citations concerning the reprocessing of spent nuclear fuel with specific emphasis on cost factors, technology, methodology, handling, management, environmental impacts, and nuclear fuel cycles. (This updated bibliography contains 136 citations, 30 of which are new entries to the previous edition.)

18K. Reactor Physics

DE82700654 MF **A01**
Netherlands Energy Research Foundation ECN, Petten.
Fast Reactor Programme. Fourth Quarter 1979 Progress Report.
J. C. Plakman. Jun 81, 53p ECN-95
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The accuracy requirements and the status of the evaluated fission-product cross sections for fast reactors are reviewed; the work on calculating the sensitivity of the sodium void effect to fission-product cross sections is described; some results of the intercomparison of adjusted data sets for capture cross sections of fission-products (RCN-2A and CARNAVAL-IV) are discussed; the applicability of the maximum-likelihood method for the analysis of resolved resonance parameters for a large class of fission-product nuclides is demonstrated; the neutron cross sections for corrosion product exp 64 Ni are evaluated. Some results of post-irradiation examination of a loss-of-cooling experiment are given; the progress in testing the equipment and instrumentation for transient-overpower experiments is reported. The proceedings in the thermochemical investigations on uranium compounds with some fission-products are described. The creep behaviour of a heat of DIN 1.4948 parent metal is investigated with respect to the changes in strain with different test temperatures. Sodium smoke aerosols have been produced and analysed with respect to their aerodynamic behaviour and morphology. The two-phase local boiling experiments have been analysed to find criteria for the occurrence of different boiling regimes with the objection to deduce general dryout correlations. (Atomindex citation 13:648300)

DE82701305 PC **A02**/MF **A01**
Centro Tecnico Aeroespacial, Sao Jose dos Campos (Brazil). Inst. Tecnologico de Aeronautica.
Determination of the Neutron Flux for a Possible Way of Controlling a Fast Reactor Through the Reflector.
A. W. A. de Souza. Aug 79, 24p CTA-EAV-008/79
In Portuguese.
U.S. Sales Only.

The determination of time dependent flux is made in a fast reactor with the core embraced by a perfect reflector. The fuel burnup is taken in account establishing a nonlinear diffusion problem. A stable numeric scheme is done and the integration of two limit cases is obtained. Finally, one possibility of reactor control through the variation between two cases is discussed. (Atomindex citation 13:659827)

DE82780536 MF **A01**
International Atomic Energy Agency, Seibersdorf (Austria). Labs.
Compilation of Neutron Flux Density Spectra and Reaction Rates in Different Neutron Fields. Vol. 1.
C. Ertek. Jun 79, 327p IAEA-RL-61(V.1)
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Separate abstracts are presented for each of the papers included in the data base.

DE82903126 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
How to Evaluate the Variance-Covariance Matrix of an Integral Experiment.
M. Petilli. Sep 80, 54p CNEN-RT/FI-(80)18
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The procedure to follow to obtain the variance-covariance matrix of an integral experiment is described. Results from integral measurements of fission cross sections performed at NBS and ORNL are used for the sample problem. It is indicated how to calculate absolute values from ratio measurements and how to combine multiple measurements of same parameters. Moreover programs to do this are presented. (ERA citation 07:043494)

DE82903127 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Ricerca Tecnologica di Base e Avanzata.
Comparison of Calculational Schemes CITATION (CNEN) and CODNUC (CEA) for the Neutronic Parameters of a Superphenix Type Nuclear Power Plant.
J. C. Cabrillat, R. Conversano, G. Furini, and J. M. Vandeborre. Dec 80, 30p CNEN-RT/FI-(80)20
In Italian.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

A comparison is made between the French calculational scheme (CODNUC), currently used at CEA for neutronic studies, and the CNEN one (CITATION). The job task is to collect information about the coherence between the results of optimization calculations, simultaneously made at CEA and at CNEN and devoted to the study of advanced fast reactor core concepts (heterogeneous cores). Geometry and material compositions are the same of the Superphenix type advanced reactor cores. Final results show a systematic difference on K/sub eff/ values of about 200 pcm, and a maximum of 1% on power distributions. (ERA citation 07:043418)

DE82903542 MF **A01**
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
SIXTUS: A Two-Dimensional Diffusion-Theory Nodal Code in Hexagonal Geometry.
J. J. Arkuszewski. Oct 80, 80p EIR-410
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

The purpose of the work reported was to develop, implement and test a fast nodal approach for the 2D system of regular hexagons with two major goals in sight: further extension to 3 dimensions (hex-z geometry) and practical application for HTR reactor type. Because of the inseparability of hexagonal problems in x,y variables, the experience and techniques accumulated at the present state of art of nodal methods were of limited use. In particular the concept of the transverse leakage has been found to be not applicable. The local nodal solution to the diffusion equation has been sought in the form of a special class of exact solutions inside the node which are called the elementary solutions, therefore the method could be termed as a weak element approximation (Rose, 1975). The coupling between the nodes is expressed in terms of partial currents. These developments were the basis for writing an experimental code SIXTUS, where some nonconventional iterative methods have been used both in inner and outer iterations. (ERA citation 07:046713)

NUREG/CP-0034-V1 PC **A24**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Proceedings of the Topical Meeting on Advances in Reactor Physics and Core Thermal Hydraulics Held at Kiamesha Lake, NY. on September 22-24, 1982. Volume 1.
Aug 82, 554p
Sponsored in part by American Nuclear Society. Northeastern New York Section.

Reactor physics, core thermal hydraulics, and the interactions between core physics and thermal hydraulics are covered both for thermal reactors and for fast breeders. There are sessions on current challenges in these areas, on measurement and analysis of fast reactor physics parameters, on coupled core physics and thermal-hydraulics analysis, on in-core fuel management, on nodal and homogenization methods in reactor physics, on core thermal hydraulic and nuclear instrumentation, and on validation of fast reactor thermal hydraulic methods.

NUREG/CP-0034-V2 PC **A99**/MF **A01**
Nuclear Regulatory Commission, Washington, DC.
Proceedings of the Topical Meeting on Advances in Reactor Physics and Core Thermal Hydraulics Held at Kiamesha Lake, NY. on September 22-24, 1982. Volume 2.
Aug 82, 658p
Sponsored in part by American Nuclear Society. Northeastern New York Section.

Reactor physics, core thermal hydraulics, and the interactions between core physics and thermal hydraulics are covered both for thermal reactors and for fast breeders.

18M. Reactors (Non-Power)

DE82007227 MF **A01**
Gas-Cooled Reactor Associates, La Jolla, CA.
Industrial Process Heat Market Assessment.
S. Bresnick. Dec 81, 240p DOE/SF/02034-T45, GCRA-82-003
Contract AC03-78SF02034
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

This report is designed to be a reference resource, giving a broad perspective of the potential HTGR market for industrial process heat. It is intended to serve as a briefing document for those wishing to obtain background information and also to serve as a starting point from which more detailed and refined studies may be undertaken. In doing so, the report presents a qualitative and quantitative description of the industrial process heat market in the US, provides a summary discussion of cogeneration experience to date, and outlines the existing institutional and financial framework for cogeneration. The intent is to give the reader an understanding of the current situation and experience in this area. The cogeneration area in particular is an evolving one because of regulations and tax laws, which are still in the process of being developed and interpreted. The report presents the latest developments in regulatory and legislative activities which are associated with that technology. Finally, the report presents a brief description of the three HTGR systems under study during the current fiscal year and describes the specific market characteristics which each application is designed to serve.

18N. Snap Technology

DE82015012 MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Exp 238 Pu Fuel Form Processes. Quarterly Report, July-September 1981.
Apr 82, 33p DPST-81-128-3
Contract AC09-76SR00001
Best available copy from document source. Available in microfiche only.

This report is one of a series to summarize progress in the Savannah River Laboratory exp 238 Pu Fuel Form Program. Goals of the Savannah River Laboratory (SRL) program include providing technical support for the production of exp 238 PuO sub 2 fuel forms in the Savannah River Plant's (SRP) Plutonium Fuel Form (PuFF) Facility. This part of the program includes: demonstration of processes and techniques developed by the Los Alamos National Laboratory (LANL) for production at SRP. Information from the demonstration will provide the technical data for technical standards and operating procedures; technical support to assist plant startup and to ensure continuation of safe and

efficient production of high-quality heat-source fuel; and technical assistance after startup to accommodate changes in product and product specifications, to assist user agencies in improving product performance, to assist SRP in making process improvements that increase efficiency and product reliability, and to adapt plant facilities for new products. This report summarizes progress in improving the quality of welds in exp 238 PuO sub 2 fuel capsules. (ERA citation 07:042671)

19.

ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A118 539/6 PC **A04**/MF **A01**
Rockwell International, Canoga Park, CA. Rocketdyne Div.
HMX Combustion Modification.
Annual rept. 1 Mar 81-31 Mar 82,
J. E. Flanagan, M. B. Frankel, and D. O. Woolery. Apr 82, 62p RI/RD82-223, AFOSR-TR-82-0653
Contract F49620-81-C-0031

Studies conducted to determine the role of gas phase kinetics on the combustion of HMX indicated that gas phase interactions strongly influence, if not dictate, the combustion process. To investigate the role of gas phase interactions, quantitative analyses were conducted on the gas phase product distributions from HMX and isotopically labeled (ring N15) HMX with and without additives. A pyrolysis unit interfaced to a gas chromatograph and mass spectrometer was used in this study. Samples were pyrolyzed within a quartz capillary under 2 atmospheres of helium at the maximum heating rate available (approximately 850 C per second).

AD-A118 605/5 PC **A05**/MF **A01**
Weapons Systems Research Lab., Adelaide (Australia).
The Use of the 'BLAKE' Computer Program to Calculate Thermodynamic Properties of Australian-Made Gun Propellants.
Technical rept.,
A. R. Rye. Apr 82, 80p Rept no. WSRL-0269-TR

The BLAKE computer program has been used to calculate certain quantities required for gun interior ballistic simulation and prediction. Thermodynamic data for gun propellants manufactured in Australia, and several which are candidates for local production, are tabulated for reference. A summary of the theoretical framework of the program is included. (Author)

AD-A118 616/2 PC **A04**/MF **A01**
SRI International, Menlo Park, CA.
Deflagration-to-Detonation in HMX-Based Propellants.
Final rept. 1 Jan 77-1 Nov 81,
M. Cowperthwaite, and W. J. Murri. Mar 82, 73p AFOSR-TR-82-0673
Contract F49620-77-C-0039

The objective of the research was to develop the capability of assessing the deflagration-to-detonation transistion (DDT) hazard in HMX-based propellants. Theoretical and experimental studies were undertaken to elucidate mechanisms of DDT, to establish conditions for its occurrence, and to formulate a satisfactory model for its quantitative description. The theoretical studies were concerned with the thermo-hydrodynamic treatment of DDT. Equations governing flames treated as reactive discontinuities were derived, and conditions were established for shock formation in front of an accelerating flame. Model solutions to the one-dimensional equations governing an accelerating flame in a closed table were constructed and examined to gain an insight into DDT. In the experimental study, an assembly was designed to allow incorporation of stress gages into propellant charges during the casting process, thereby eliminating the expensive machining and grooving operations conventionally used in constructing targets for Lagrange gage experiments. DDT experiments were performed in steel and Lexan confinement with propellant supplied by Edwards Air Force Base. However, internal pressure histories were recorded for the first time in a DDT experiment in the compressed propellant confined by steel. The gages recorded time periods of 300-500 microns, and peak pressure in the 2.5 to 4 kbar region. The limited pressure buildup is attributed to the small percentage of HMX in the propellant.

AD-A118 672/5 PC **A03**/MF **A01**
Army Armament Research and Development Command, Dover, NJ. Large Caliber Weapon Systems Lab.
Small Caliber Weapon Rounds Counter System.
Final rept. Sep 78-Sep 81,
Elspeth Huss, and Michael Potorti. Jul 82, 37p ARLCD-TR-82006, SBI-AD-E400 868

The small caliber weapons rounds counter system was designed to facilitate the testing of small caliber weapons. This system detects the projectile fired by a small caliber weapon and displays the number of rounds fired or calculates the rate of fire for the weapons.

AD-A118 676/6 PC **A06**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Ballistic Research Lab.
Angular Motion of a Spinning Projectile with a Viscous Liquid Payload.
Final rept.,
Charles H. Murphy. Aug 82, 117p ARBRL-MR-03194, SBI-AD-F300 076
Supersedes Rept. no. ARBRL-IMR-742 dated Apr 82.

Liquid payload motion can have a significant effect on the stability of a spinning projectile. A general definition of the liquid moment is developed and expressions are obtained for the frequencies and damping rates of the projectile's angular motion. An expression for the liquid pressure moment is derived without the unnecessary mathematical approximations of the Stewartson-Wedemeyer theory, and wall shear effects are added to this improved SW pressure moment to obtain the total liquid moment. This moment expression applies to cavities that are fully filled, partially filled or fully filled with a central rod. The improved theory shows that as the Reynolds number decreases, (a) the eigenfrequency-related side moment peaks decrease steadily in size but that (b) the average side moment level first increases and then decreases. This latter predicted behavior is in good qualitative agreement with the D'Amico-Miller conjecture that relates the liquid spin-down moment to the liquid side moment. Good agreement is also obtained between the theory and all available published data from liquid-filled gyroscope experiments.

AD-A118 677/4 PC **A04**/MF **A01**
Army Armament Research and Development Command, Dover, NJ. Large Caliber Weapon Systems Lab.
The Correlation of Nitrocellulose Properties and Cellulose Feedstock Crystal Structure.
Final rept. 1980-1982,
H. J. Prask, and C. S. Choi. Jul 82, 51p ARLCD-TR-82011, SBI-AD-E400 878

Studies of cellulose crystallinity are reviewed. The total-profile analysis method has been applied to x-ray diffraction data for celluloses from linter and woodpulp sources. Good agreement is obtained with published structure factors and lattice parameters from fiber studies, if a distinct amorphous profile is included in our analysis. Correlations between cellulose and nitrocellulose properties and the measured cellulose crystallographic parameters are indicated.

AD-A118 682/4 PC **A02**/MF **A01**
Army Armament Research and Development Command, Aberdeen Proving Ground, MD. Chemical Systems Lab.
White Phosphorus-Felt Smoke: Effects on Reproduction in the Rat.
Technical rept. Aug 78-Jun 79,
William C. Starke, Ronald J. Pellerin, and David C. Burnett. Jul 82, 23p ARCSL-TR-82002, SBI-AD-E410 576

The effects of white phosphorus-felt smoke as a potential teratogen in producing a dominant lethal mutation (DLM) or on reproduction in a single generation (SG) in rats were investigated. Pregnant rats were exposed to WP-felt smoke in concentrations of 0.500, or 1,000 mg/cu m for 15 min/day for 10 consecutive days. On day 20 of gestation, their fetuses were derived by Caesarean section. One control pup had unilateral anophthalmia and one had narrow atria. One from the 1,000 mg/cu m group had a short tongue and one had narrow atria and a thin-walled heart. Proven (successfully mated) male rats for the DLM study were exposed to the same conditions 5 days/week for 10 weeks and were mated with two groups of virgin females for 1 week each. The first group of females mated to males exposed to the 500 mg/cu m dose had significantly more dams with at least one resorption than did the group mated to control males. Males in the SG study were exposed to the same conditions as the DLM males; the females were exposed to these conditions for the last 3 weeks of the males' exposures. Pups born to the dams in the 1,000 mg/cu m group had significantly lower body weights on all weighing days. They also had significantly lower indices of variability and survival. It is probable that, at the doses used in these studies, WP-felt cannot be considered a teratogen nor does it produce dominant lethal mutations. It might, however, cause lower birth weights and retard the rate of development in the rat.

DE82013759 PC **A04**/MF **A01**
Lawrence Livermore National Lab., CA.
Distortion Energy Stresses in Explosion-Containment Vessels.
E. Platt. Apr 81, 52p UCID-19204
Contract W-7405-ENG-48
Portions of document are illegible.
Microfiche only after original copies are exhausted.

Explosion containment vessels that are not precisely symmetrical develop widely varying stresses at different locations. Measured and computer generated maximum stresses have been compared with local stretching-mode stresses as a mean of analyzing shape and location effects. A stress number based upon distortion energy stresses in the two modes have been usedN for this purpose on a collection of data. An algorithm for general shell thickness selection has been proposed on the basis of this stress number. In addition, rules for reinforcement at critical points, strength requirements at flanged openings, and the related bolting loads have been investigated.

DE82014957 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
FUSE: A Simple Simulation Model for a Flyer-Plate Detonator System.
J. M. Zentler. Mar 82, 19p UCRL-53260
Contract W-7405-ENG-48
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FUSE is a specialized single-zone MHD computer code developed at Lawrence Livermore National Laboratory. It is used to simulate flyer-plate detonators and their associated firing systems. The model was validated for the bridgewire preburst region and for postburst times prior to initiating the high explosive. Good experimental agreement was achieved. FUSE has aided engineers to design, optimize, and validate firing systems as well as to test new concepts associated with the system.

N82-29618/7 PC **A02**/MF **A01**
Materials Research Labs., Melbourne (Australia).
A C-Shaped Fracture Toughness Specimen from the Wall of a 5 Inch/54, MK 64, Naval Projectile.
D. S. Saunders. Oct 81, 19p MRL-R-831, AR-002-737

The suitability of a C-shaped specimen configuration for the measurement of the fracture toughness of an artillery projectile manufactured from a high fragmentation steel is examined. A conventional shell steel, taken from the Australian 5 inch/54 HE naval projectile, was heat treated to fracture toughness states approximately corresponding to those of the steels used in high fragmentation projectiles. The practical aspects of specimen preparation and testing are assessed in this work.

PATENT-4 328 736 Not available NTIS
Department of the Navy, Washington, DC.
Fuseless Explosive Propellant Cartridge.
Patent,

Daniel G. True, and Robert J. Taylor. Filed 2 Jun 80, patented 11 May 82, 4p AD-D009 666/9, PAT-APPL-6-155 719
Supersedes PAT-APPL-6-155 719, AD-D007 307.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

The patent describes an explosive propellant cartridge for use in propellant actuated devices. The cartridge contains only the explosive propellant which is stable and safe when not confined in a vessel capable of high pressure containment and does not contain the less stable fusing element. The propellant is contained in an annular space between concentric tubes with the inner tube being perforated. An elongated fusing element is inserted into the inner tube after the cartridge is secured in the propellant-actuated device. (Author)

19D. Explosions, Ballistics, and Armor

PB82-266149 PC **A03**/MF **A01**
Stiftelsen Svensk Detonikforskning, Stockholm.
Ett System foer Konturspraengning med Styrd Sprickinitiering (A System for Contour Blasting with Guided Cracking),
Gert Bjarnholt, Roger Holmberg, and Finn Oucherlony. 1982, 28p DS-1982-3
Text in Swedish.

A system for contour blasting with a charge that makes use of the linear shaped charge principle has been studied. In one operation the charge creates two notches along the borehole wall and breaks the rock mass. The built in notching capability makes it possible to reduce the specific charge and the borehold pressure to 1/3 of what is used in conventional contour blasting and to ensure that cracks are initiated and propagated only at the notches and nowhere else. The notching capability of linear shaped charges has been studied experimentally and the bore hole pressure calculated to aid in optimization of a charge for future field experiments.

19F. Guns

AD-A118 823/4 PC **A09**/MF **A01**
JAYCOR, Alexandria, VA.
Test Planning, Collection, and Analysis of Pressure Data Resulting from Army Weapon Systems. Volume IV. Data Analysis of the M198 and M109 May 1979 Firings.
Final rept.,
Steve Slinker, and Henry C. Evans. May 80, 186p
Contract DAMD17-78-C-8087
See also Volume 5, AD-A118 400.

The objective of this research project was the analysis of the overpressure data collected during the M198 and M109 howitzer firings in May 1979. This analysis was required to assess the possibility of non-auditory damage to the crews of these weapons when the howitzers were fired with the M203 charge. The Gunner's position of the M198 towed howitzer was found to be unsafe. The crew compartment of the M109 self-propelled howitzer also had unacceptable overpressures when the compartment hatches were closed. (Author)

20. PHYSICS

20A. Acoustics

PAT-APPL-6-138 013 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Ellipticized Acoustic Lens Providing Balanced Astigmatism.
Patent Application,
Robert L. Sternberg. Filed 7 Apr 80, 21p AD-D009 644/6
Portions of this document are not fully legible.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

An ellipticized singlet azimuth versus elevation optimized and aperture extremized nonspherical acoustic lens antenna of very low or even minimal F-number providing balanced astigmatism for wide angle acoustical applications in underwater sound is described. The acoustic lens has an elliptical periphery and surfaces defined by a system of nonlinear partial differential equations, the surfaces acting together to produce two perfect primary off-axis foci F and F' at a finite distance in back of the lens and two perfect conjugate off-axis foci F sub infinity and F' sub infinity in front of the acoustic lens at infinity; i.e., the lens simultaneously focuses energy from the primary foci F and F' into two off-axis parallel ray plane wave sonic beams directed towards infinity at equal but opposite angles with respect to the acoustic lens axis. The acoustic lens may be built of various materials such as Sylgard rubber RTV 3120 or as a liquid filled thin metal walled shell lens using the liquid filling any suitable organic or inorganic liquid such as carbon tetrachloride, fluorolube or certain liquid metal mixtures. (Author)

20B. Crystallography

AD-A118 592/5 PC **A02**/MF **A01**
Rome Air Development Center, Hanscom AFB, MA. Deputy for Electronic Technology.
The Effect of a Continuous Etch on the Growth Rate and Morphology of InP Prepared by the Vapor Phase Epitaxial-Hydride Method,
Thomas E. Erstfeld, and Kenneth P. Quinlan. 24 Nov 81, 19p Rept no. RADC/ETR-82-0010
Pub. in Jnl. of Electronic Materials, v11 n4 p647-662 Jul 82.

No abstract available.

AD-A118 654/3 PC **A03**/MF **A01**
Spire Corp., Bedford, MA.
HgCdTe Fabrication Using Directed Energy Techniques.
Semiannual technical rept. 5 Apr-30 Jun 82,
Anton C. Greenwald, and Robert G. Wolfson. Jul 82, 43p Rept no. SAR-82-10082-02
Contract MDA903-81-C-0410, ARPA Order-3800
Prepared in cooperation with New England Research Center, Inc., Sudbury, MA.

The goal of this research is to produce large-area, thin-film, single-crystal HgCdTe material for infrared detectors. This report describes initial results for the evaporation of CdTe onto insulating crystalline substrates (hot wall epitaxy), improvement of the surface morphology by pulsed electron-beam processing, and conversion to HgCdTe by evaporation and diffusion at constant temperature. Improvement in quality over past results and an increase in sample size to 2-inch diameter is expected with upgraded equipment described herein. (Author)

AD-A118 679/0 PC **A03**/MF **A01**
Naval Surface Weapons Center, Silver Spring, MD.
Ultrasonic Pulse Propagation in Constant-Group-Velocity Media.
Interim rept. Mar-Jul 82,
Palmer L. Edwards. 1 Jun 82, 30p NSWC/TR-82-296, SBI-AD-F500 058

Results are presented of calculations made of distortion experienced by ultrasonic pulses in transmission through dispersive constant-group-velocity media, and the effects that it may have on velocity measurements. Three types of pulses were considered; a pulsed sine wave of constant amplitude, a pulsed sine wave with amplitude varying as sine-squared, and a rectangular pulse. It is shown that the individual waves in the pulsed sine waves move with the phase velocity of a continuous wave, and the envelope moves with the group velocity. It was also found that a pulsed sine wave in going a certain distance in a constant-group-velocity medium repeats itself, and midway between these distances is the negative of the values at the repetition distances. Because of this repetition phenomenon it is seen that the pulses do not spread as is normally the case in dispersive media. The envelopes of the propagated waves were also calculated, an in agreement with Brillouin's results (Wave Propagation and Group Velocity, Academic, New York, I960) it was found that if the envelope contains negligible frequency components above the carrier frequency then the envelope is not distorted in passing through a dispersive constant-group-velocity medium.

AD-A118 748/3 PC **A03**/MF **A01**
Litton Systems, Inc., Morris Plains, NJ. Airtron Div.
Manufacturing Methods and Technology Engineering for 'Growth of Large Diameter Nd:YAG Laser Crystals'.
Interim progress rept. 1 Apr 80-31 Mar 81,
Robert Uhrin, and Roger F. Belt. Mar 82, 38p
Contract DAAB08-77-C-0375

Continued experimentation on the growth of Nd:YAG in boule sizes of 2 inch diameter was performed in this report period. The axial and radial gradients received more attention. It was found that the use of a Dy2O3 stabilized zirconia for insulation has given a very favorable growth gradient for our 4.5 x 4.5 inch crucibles. Twelve runs were started over a year.

AD-A118 800/2 PC **A06**/MF **A01**
North Carolina State Univ. at Raleigh. Dept. of Materials Engineering.
Single Crystal Epitaxy and Characterization of Beta-SiC.
Final technical rept. 1 Jan-31 Dec 81,
R. F. Davis. Jul 82, 101p Rept no. 243-027-013
Contract N00014-79-C-0121

Epitaxial thin films of beta-SiC of up to five microns in thickness have been reproducibly grown on (100) and (111) Si single crystal wafers. A two-step process involving the initial chemical conversion of the Si surface to SiC using C2H4 alone followed by direct CVD of SiC using both SiH4 and C2H4 was employed to achieve this objective. Theoretical CVD phase diagrams for the Si-C-H and Si-C-Ar system have been calculated for various reactive gases, Si/Si+C ratios, temperatures and total pressures. Amorphous SiC has also been produced using a remodeled rf sputtering unit. (Author)

N82-29335/8 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Approximate Analysis of Thermal Convection in a Crystal-Growth Cell for Spacelab 3.
R. F. Dressler. Jun 82, 11p NASA-TP-2016, EN-1

The transient and steady thermal convection in microgravity is described. The approach is applicable to many three dimensional flows in containers of various shapes with various thermal gradients imposed. The method employs known analytical solutions to two dimensional thermal flows in simpler geometries, and does not require recourse to numerical calculations by computer.

N82-30106/0 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
An Analytical Approach to Thermal Modeling of Bridgman Type Crystal Growth: One Dimensional Analysis. Computer Program Users Manual.
E. K. Cothran. May 82, 88p NASA-TM-82487, NAS 1.15:82487

The computer program written in support of one dimensional analytical approach to thermal modeling of Bridgman type crystal growth is presented. The program listing and flow charts are included, along with the complete thermal model. Sample problems include detailed comments on input and output to aid the first time user.

PB82-259748 PC **A02**/MF **A01**
Wacker-Chemie G.m.b.H., Burghausen (Germany, F.R.).

Research and Development of Technologies for the Preparation of III-V Semiconductor Materials and on Methods for Evaluation of the Quality of These Materials - Gallium Arsenide Crystals - Gallium Arsenide Crucible Pulling,
M. Blaette. 1982, 24p BMFT-FB-T-81-022
Trans. of mono. Erforschung und Entwicklung neuer Technologien zur Herstellung von III/V-Halbleitergrundstoffen und von Testverfahren zur Bestimmung der Qualitat dieser Materialien. Projekt: Galliumarsenid-Enkristalle. Teilprojekt: Galliumarsenid-Tiegelziehen, n.p., Jan 81. See also N82-14949.

The economic synthesis of the polycrystalline starting material was investigated. For the industrial production of gallium arsenide crystals, which are used as substrates for the epitaxial growth of basic material for light emitting diodes, the Czochralski liquid encapsulation technique was developed. After preliminary experiments in a small puller, the parameters for crystal growth were tested and optimized in pulling equipment which was specially constructed for this purpose. Methods for diameter control were tested as well. By means of production scale pulling of crystals with a diameter of 50 mm and a weight of 1.4 kg with dislocation densities of 50,000/sq cm, the objective was fully achieved.

PB82-259888 PC **A02**/MF **A01**
Wacker-Chemie G.m.b.H., Burghausen (Germany, F.R.).
Research and Development on Technologies for the Preparation of III-V Semiconductor Materials and on Methods for Evaluation of the Quality of These Materials: Production of Gallium Phosphide Crystals,
Michael Blaette. Jul 82, 19p BMFT-FB-T-81-021
Trans. of mono. Erforschung und Entwicklung neuer Technologien zur Herstellung von III/V Halbleitergrundstoffen und von Testverfahren zur Bestimmung der Qualitat dieser Materialien. Projekt: Herstellung von Galliumphosphid, n.p., Mar 81. See also N82-14948.

Methods for economic synthesis and crystal growth of gallium phosphide were developed. Polycrystalline ingots up to 800 gr of the dense and homogeneous quality necessary for crystal growth are currently produced with very good yield. The conditions for high pressure crystal growth by the liquid encapsulation technique were thoroughly investigated and optimized in a manner that permits industrial production of substrate quality crystals with a weight of 700 grams and a diameter of 50 mm. Diameter variations, common in the growth of GaP crystals, can be reduced to a few millimeters by a monitoring system based on crystal weighing.

PB82-261645 Not available NTIS
National Bureau of Standards, Washington, DC.
Powder Neutron Diffraction Study of the Nonstoichiometric Solid Solution of Lithium Tantalate 9LiTaO3:Ta2O5.
Final rept.,
A. Santoro, R. S. Roth, and M. Austin. 1982, 5p
Pub. in Acta Crystallographica B38, p1094-1098 1982.

The nonstoichiometric solid solution 9LiTaO3:Ta2O5 has been studied with the powder neutron diffraction technique, and the intensity data have been used to refine several structural models with the Rietveld method. The results of these calculations show that the best fit to the experimental observations is obtained with the model for the defective structure proposed by Nassau & Lines. Data have also been collected from stoichiometric LiTaO3, and the results of the refinement of this structure agree well with those obtained with single-crystal diffraction techniques.

PB82-261843 Not available NTIS
National Bureau of Standards, Washington, DC.
The Structure of Sodium Strontium Phosphate Nonahydrate.
Final rept.,
Shozo Takagi, M. Mathew, and W. E. Brown. 1982, 7p
Sponsored in part by American Dental Association Health Foundation, Chicago, Il.
Pub. in Acta Crystallographica B38, p1408-1413 1982/

The crystal structure of SrNaPO4.9H2O has been determined by single-crystal X-ray diffraction. Results are discussed.

PB82-875436 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Crystal Structures: Computer Analysis. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 102p
Supersedes PB81-856627.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning computerized simulation, mathematical modelling, computer codes, and calculations for theoretical and applied analysis of crystal structures of elements, organic and inorganic comounds, and alloys. (This updated bibliography contains 90 citations, 35 of which are new entries to the previous edition.)

PB82-875444 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Crystal Structures: Computer Analysis. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 185p
Supersedes PB81-856619.

This bibliography contains citations concerning computerized simulation, mathematical modelling, computer codes, and calculations for theoretical and applied analysis of crystal structures of elements, organic and inorganic compounds, and alloys. (This updated bibliography contains 148 citations, 51 of which are new entries to the previous edition.)

20D. Fluid Mechanics

AD-A118 466/2 Not available NTIS
Aeronautical Research Associates of Princeton, Inc., NJ.
Viscous Decay of Long Internal Solitary Waves,
C. Leone, Harvey Segur, and J. L. Hammack. 25 Nov 81, 3p
Contract N00014-80-C-0048
Prepared in cooperation with California Univ., Berkeley. Dept. of Civil Engineering.
Availability: Pub. in Physics of Fluids, v25 n6 p942-944 Jun 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 529/7 Not available NTIS
Aeronautical Research Associates of Princeton, Inc., NJ.
Soliton Models of Long Internal Waves,
Harvey Segur, and J. L. Hammack. 5 May 81, 20p
Contract N00014-80-C-0048
Prepared in cooperation with California Univ. Berkeley, Dept. of Civil Engineering.
Availability: Pub. in Jnl. of Fluid Mechanics, v118 p285-304 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 597/4 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Nonlinear Gravity-Capillary Standing Waves in Water of Arbitrary Uniform Depth.
Technical summary rept.,
Jean-Marc Vanden-Broeck. Jun 82, 15p Rept no. MRC-TSR-2392
Contract DAAG29-80-C-0041, Grant NSF-MCS79-27062

Gravity-capillary standing waves in water of arbitrary uniform depth are considered. The classical perturbation calculation yields unbounded coefficients for some critical values of the depth. A perturbation solution valid at the first critical value of the depth is derived. It is found that two solutions exist at this critical value. Numerical computations indicate that these solutions are members of two different families of solutions. Graphs of the results are included. (Author)

AD-A118 617/0 PC **A04**/MF **A01**
Wisconsin Univ.-Madison. Mathematics Research Center.
Stewartson's Triple Deck.
Technical summary rept.,
R. E. Meyer. Jun 82, 57p Rept no. MRC-TSR-2391
Contract DAAG29-80-C-0041, Grant NSF-MCS80-01960

An introduction to triple-deck theory for steady, two-dimensional boundary layers in low-speed flow is presented. It aims to clarify how the rational structure of the theory can rest on few premises and to make its new ideas and challenges more widely accessible. (Author)

AD-A118 665/9 PC **A03**/MF **A01**
University of Southern California, Los Angeles. Dept. of Aerospace Engineering.
The Transition and Dynamics of Bounded and Free Shear Layers.
Final rept. 1 Apr 78-31 Mar 82,
John Laufer, Richard Kaplan, and Chih-Ming Ho. Mar 82, 27p AFOSR-TR-82-0652
Contract F49620-78-C-0060

Research activities in transitional and turbulent boundary layers and free shear flows are described. Experimental efforts which focused on an understanding of turbulent 'spots' in a developing laminar boundary layer flow, the development of conditional sampling technique for high response anemometry data, studies of spanwise streaks in the near wall region of a turbulent boundary layer and the dynamics of free and impinging jet flows are described. Analytical studies of the nonlinear stability of plane stagnation flows are also discussed.

AD-A118 725/1 PC **A02**/MF **A01**
California Inst. of Tech., Pasadena. Dept. of Applied Mathematics.
On Finite Amplitude Water Waves,
G. B. Whitham. 3 Feb 81, 13p
Pub. in Proceedings of the Indian Academy of Science (Engineering Science) v4 pt3 p259-268 Sep 81.

No abstract available.

DE82010717 PC **A04**/MF **A01**
New York Univ., NY. Courant Mathematics and Computing Lab.
Existence of a Global Weak Solution to the Nonlinear Waterhammer Program.
M. Luskin, and B. Temple. Dec 81, 60p DOE/ER/03077-174
Contract AC02-76ER03077
Portions of document are illegible.

The existence of global weak solutions to an initial - boundary value problem for a nonlinear hyperbolic system which models fluid flow in a pipe is proven. The effect of friction is modeled by adding a quadratic zero order term to the system of conservation laws for compressible, frictionless flow. A priori bounds are obtained by means of a nonincreasing functional that is compatible with the friction effects. The boundary values for this problem cannot be imposed weakly, so new results on the regularity of the solution at the boundary are given. (ERA citation 07:044401)

DE82014426 PC **A02**/MF **A01**
Argonne National Lab., IL.
Assessment of Heat-Tranfer Correlations for Turbulent Water Flow Through a Pipe at Prandtl Numbers of 6.0 and 11.6.
J. J. Lorenz, D. T. Yung, C. B. Panchal, and G. E. Layton. Jan 82, 14p ANL/OTEC-PS-11
Contract W-31-109-ENG-38

An experimental investigation assessed the accuracy of existing heat-transfer correlations for turbulent flow of water in smooth tubes at Prandtl numbers (Pr) of 6.0 and 11.6. The main purpose of this effort was to select the best correlations for use in designing ocean thermal energy conversion (OTEC) heat exchangers. Two shell-and-tube heat exchangers, a plain-tube evaporator and a plain-tube condenser, were tested to obtain data for water at Pr = 6.0 (80 exp 0 F) and Pr = 11.6 (40 exp 0 F), respectively. From measured values of the overall heat-transfer coefficients, the water-side

coefficients were determined by the Wilson plot method. The results were used as a data base for evaluating seven widely used heat-transfer correlations. Overall, the best correlations were found to be Petukhov-Popov and Sleicher-Rouse, both of which agree within +-5% with the experimental data over the entire Reynolds number range. The Dittus-Boelter and Sieder-Tate correlations, popular with heat-transfer engineers, underpredict the data by 5% to 15% and thus are considered too conservative. Predictions from the Kays correlation compare favorably with the data at Pr = 6.0 but are slightly high (nonconservative) at Pr = 11.6. The Eagle-Ferguson correlation is acceptable at Pr = 6.0 but a little too conservative at Pr = 11.6. The Braun correlation is the poorest of the group, with predictions well below the data at Pr = 6.0 and above the data at Pr = 11.6. (ERA citation 07:042930)

DE82750455 MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Reaktorbauelemente.
Transition from Slug to Annular Flow in Horizontal Air-Water Flow.
J. Reismann, H. John, and W. Seeger. Nov 81, 43p KFK-3189
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The transition from slug to annular flow in horizontal air-water and steam-water flow was investigated. Test sections of 50; 66.6 and 80 mm ID were used. The system pressure was 0.2 and 0.5 MPa in the air-water experiments and 2.5; 5; 7.5 and 10 MPa in the steam-water experiments. For flow pattern detection local impedance probes were used. This method was compared in a part of the experiments with differential pressure and gamma-beam measurements. The flow regime boundary is shifting strongly to smaller values of the superficial gas velocity with increasing pressure. Correlations from literature fit unsatisfactorily the experimental results. A new correlation is presented. (ERA citation 07:051126)

DE82903102 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Reattori Termici.
Experimental Study on Two-Phase Flow Instability in Parallel Channels with Different Heat Flux Profile.
M. Cumo, G. Palazzi, and L. Rinaldi. Jun 81, 26p CNEN-RT/ING-(81)1
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

An experimental investigation on the instability in two-parallel channels has been carried out using water as operating fluid. 116 tests have been performed in different conditions to examine the threshold and the nature of flow oscillations. Two round tubes, 9 m long, 2.12 cm in diameter, connecting inlet and outlet tanks, make up the test section. Each tube is heated by Joule effect with the same power but with different heat flux profile: the first uniform, the second increasing from inlet to outlet step by step. The pressure drop at the inlet of each tube can be varied by means of regulation valves. The work conditions were pressure 3.5 and 5.0 MPa, specific mass flow-rate 300/800 kg/m exp 2 s, subcooling until 500 KJ/kg. Instability threshold was obtained with various combinations of the parameters and in two different ways, increasing the power or decreasing the flowrate. The oscillations are typical of the density wave instability and their periods are nearly related to the transit time of the fluid through the heating zone. The influence of the principle parameters of the system have been studied for the instability phenomenon and for the occurring of the second mode oscillations. The experimental results of the threshold instability have been compared with the LOOP 1 code results. (ERA citation 07:047679)

DE82903104 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Casaccia (Italy). Dipartimento Reattori Termici.
Thermodynamic Disequilibrium in the Critical Flow of Subcooled Liquids.
G. P. Celata, M. Cumo, G. E. Farello, P. C. Incalcaterra, and A. Naviglio. Jul 81, 15p CNEN-RT/ING-(81)14
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Critical flows of subcooled liquids are examined particularly under the profile of the time extension of metastability state. The geometrical shape of the two-phase jet is related to the degree of subcooling. Transversal pressure profiles in the jet are considered. (ERA citation 07:047680)

DE82903913 MF **A01**
Kansas Energy Office, Topeka. Energy Research and Resource Development Div.
Production of Alcohol Fuels Via Acid-Hydrolysis Extrusion Technology.
R. Noon, and T. Hochstetler. 1981, 47p NP-2903913
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Pilot plant data using a modified single screw grain extruder to facilitate the conversion of raw cellulosic materisls into fermentable monosaccharides via acid hydrolysis are analyzed. The following are presented: cellulose availability and cost, cellulose conversion theory, cellulose conversion performance of extrusion technology, system analysis, and economics.

N82-29262/4 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Computation of High Reynolds Number Internal/External Flows.
M. C. Cline, and R. G. Wilmoth. Oct 81, 28p NASA-TM-84829, NAS 1.15:84829
Backup Document for Aiaa Synoptic Scheduled for Publication in the Aiaa Journal, Feb. 1983.

A general, user oriented computer program, called VNAF2, developed to calculate high Reynolds number internal/external flows is described. The program solves the two dimensional, time dependent Navier-Stokes equations. Turbulence is modeled with either a mixing length, a one transport equation, or a two transport equation model. Interior grid points are computed using the explicit MacCormack scheme with special procedures to speed up the calculation in the fine grid. All boundary conditions are calculated using a reference plane characteristic scheme with the viscous terms treated as source terms. Several internal, external, and internal/external flow calculations are presented.

N82-29266/5 PC **A04**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
The Structure of a Subsonic Compressible Rectangular Jet.
Y. Hsia, A. Krothapalli, D. Baganoff, and K. Karamcheti. Jan 82, 61p NASA-TM-84824, NAS 1.15:84824
Contract F49620-79-C-0189
Prepared in Cooperation with Stanford Univ., Calif.

A subsonic jet of air emanating from a rectangular nozzle of aspect ratio 16.7 was investigated using hot-wire anemometry. Four exit Mach numbers, ranging from 0.18 to 0.8, were studied. Results of the hot-wire measurements show that a compressible subsonic rectangular jet behaves similar to an incompressible jet. It exhibits three distinct regions characterized by the decay of the mean axial velocity along the axis of the jet: a potential core region, a two dimensional type region, and an axisymmetric type region. The effect of increasing the Mach number of the rectangular jet was found to be the extension of the two dimensional type region, and the jet behaves more nearly like a two dimensional jet at higher Mach numbers. This effect is due to the variation in the growth rate of the jet in the plane containing the long dimension of the nozzle only. The Mach number has very little effect on the spreading in the plane containing the short dimension of the nozzle. It is suggested that the turbulence structure of a compressible rectangular jet can be inferred from that of an incompressible jet.

N82-29269/9 PC **A18**/MF **A01**
Purdue Univ., Lafayette, IN. School of Mechanical Engineering.
Calculation of the Flow Field Including Boundary Layer Effects for Supersonic Mixed Compression Inlets at Angles of Attack.
J. Vadyak, and J. D. Hoffman. Jul 82, 406p NASA-CR-167941, NAS 1.26:167941
Grant NSG-3311

The flow field in supersonic mixed compression aircraft inlets at angle of attack is calculated. A zonal modeling technique is employed to obtain the solution which divides the flow field into different computational regions. The computational regions consist of a supersonic core flow, boundary layer flows adjacent to both the forebody/centerbody and cowl contours, and flow in the shock wave boundary layer interaction regions. The zonal modeling analysis is described and some computational results are presented. The governing equations for the supersonic core flow form a hyperbolic system of partial differential equations. The equations for the characteristic surfaces and the compatibility equations applicable along these surfaces are derived. The characteristic surfaces are the stream surfaces, which are surfaces composed of streamlines, and the wave surfaces, which are surfaces tangent to a Mach conoid. The compatibility equations are expressed as directional derivatives along streamlines and bicharacteristics, which are the lines of tangency between a wave surface and a Mach conoid.

N82-29270/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Velocity Gradient Method for Calulating Velocities in an Axisymmetric Annular Duct.
T. Katsanis. Jul 82, 23p NASA-TP-2029, E-1104

The velocity distribution along an arbitrary line between the inner and outer walls of an annular duct with axisymmetric swirling flow is calculated. The velocity gradient equation is used with an assumed variation of meridional streamline curvature. Upstream flow conditions can vary between the inner and outer walls, and an assumed total pressure distribution can be specified.

N82-29559/3 PC **A03**/MF **A01**
Old Dominion Univ., Norfolk, VA. Dept. of Mathematical Sciences.
Burgers Approximation for Two-Dimensional Flow past an Ellipse.
Final Report, 26 May 1981 - 25 May 1982.
J. M. Dorrepaal. Jul 82, 46p NASA-CR-169155, NAS 1.26:169155
Contract NAG1-197

A linearization of the Navier-Stokes equation due to Burgers in which vorticity is transported by the velocity field corresponding to continuous potential flow is examined. The governing equations are solved exactly for the two dimensional steady flow past an ellipse of arbitrary aspect ratio. The requirement of no slip along the surface of the ellipse results in an infinite algebraic system of linear equations for coefficients appearing in the solution. The system is truncated at a point which gives reliable results for Reynolds numbers R in the range 0 R 5. Predictions of the Burgers approximation regarding separation, drag and boundary layer behavior are investigated. In particular, Burgers linearization gives drag coefficients which are closer to observed experimental values than those obtained from Oseen's approximation. In the special case of flow past a circular cylinder, Burgers approximation predicts a boundary layer whose thickness is roughly proportional to R-1/2.

N82-29560/1 PC **A05**/MF **A01**
Tennessee Univ. Space Inst., Tullahoma.
Theoretical Analyses of Baroclinic Flows.
Quarterly Report, 1 Aug. 1981 - 31 May 1982.
B. Antar. 24 May 82, 91p NASA-CR-162048, NAS 1.26:162048
Contract NAS8-33386

A stability analysis of a thin horizontal rotating fluid layer which is subjected to arbitrary horizontal and vertical temperature gradients is presented. The basic state is a nonlinear Hadley cell which contains both Ekman and thermal boundary layers; it is given in closed form. The stability analysis is based on the linearized Navier-Stokes equations, and zonally symmetric perturbations in the form of waves propagating in the meridional direction are considered. Numerical methods were used for the stability problem. It was found that the instability sets in when the Richardson number is close to unity and that the critical Richardson number is a non-monotonic function of the Prandtl number. Further, it was found that the critical Richardson number decreases with increasing Ekman number until a critical value of the Ekman number is reached beyond which the fluid is stable.

N82-30260/5 PC **A04**/MF **A01**
Office National d'Etudes et de Recherches Aerospatiales, Paris (France).

La Recherche Aerospatiale, Bi-Monthly Bulletin, No. 1982-1, January-February 1982.
C. Sevestre. May 82, 64p ESA-TT-755
Transl. Into English from la Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1982-1, Jan.-Feb. 1982. Sponsored by Esa.

No abstract available.

PB82-261017 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Onderafdeling der Wiskunde en Informatica.
Equations for the Flow of an Incompressible, Inviscid Fluid through a Collapsible Tube under Longitudinal Tension,
J. W. Reyn. 1982, 31p 82-19

Equations for the steady and unsteady flow of an incompressible, inviscid fluid through a collapsible tube under longitudinal tension are derived. The tube is treated partly as a membrane, made of an elastic material, obeying Hooke's law, and the collapsibility of the tube is taken into account in an approximate way by replacing in the equations for an axisymmetric membrane, a term representing the resistance of the tube to area change by the tube law for collapsible tubes. The flow is assumed to be uniform in a cross-section.

PB82-261314 PC **A03**/MF **A01**
Technische Hogeschool, Delft (Netherlands). Lab. for Aero and Hydrodynamics.
A General Model for Unconfined Bubble Plumes from Extended Sources,
A. K. Chesters. May 80, 42p WTHD-127

The upward flow (plume) produced by the continuous injection of gas in a body of liquid has many important applications, aside from its intrinsic interest: destrafication of reservoirs, prevention of salt intrusion in habours, mixing in steelmaking processes, and so on. Practical situations may be divided into the unconfined case, in which the width of the body of liquid is large in comparison with that of the plume, and the confined case in which this is not so. In this report, attention is restricted to the unconfined case, for which the pressure variation outside the plume is approximately hydrostatic.

PB82-811183 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Holographic Flow Visualization. 1968-July, 1982 (Citations from the NTIS Data Base).
Sep 82, 94p
Supersedes PB81-807208 and PB80-808199.

Research covering flow in wind tunnels, gas lasers, aircraft wakes, aircraft engines, supersonic flow, and shock waves is cited. Most of the techniques involve interferometric holography. (This updated bibliography contains 85 citations, 5 of which are new entries to the previous edition.)

PB82-811191 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Holographic Flow Visualization. 1970-July, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 168p
Supersedes PB81-807216 and PB80-808207.

Worldwide research on holographic flow visualization is cited. The studies cover techniques, theory, equipment, and various applications to measure flow in lasers, shock tubes, wind tunnels, and over aerodynamic surfaces. (This updated bibliography contains 159 citations, 21 of which are new entries to the previous edition.)

20E. Masers and Lasers

AD-A118 698/0 PC **A02**/MF **A01**
Harvard Univ., Cambridge, MA. Dept. of Chemistry.
Spectroscopic Determination of Intermolecular Potentials of Gas Laser Components and of Major Atmospheric Constituents.
Final rept.,
William Klemperer. 1982, 8p AFOSR-TR-82-0661
Grant AFOSR-77-3269

A systematic study of the structure of weakly bound complexes of hydrogen fluoride has been accomplished. This research provides a broad account of the interaction of hydrogen fluoride with a variety of laser components and atmospheric constituents. Precision structures are now available for the species ArHF, CO2HF, N2OHF and SCOHF as a result of the present research program. In addition, precision structures have been obtained for ArCO2 and ArN20. This research provides the basic information necessary for reliable modelling of intermolecular forces between HF and Ar, Co2, N20 and OCS as well as between Ar and CO2 and N20.

AD-A118 699/8 PC **A02**/MF **A01**
Virginia Univ., Charlottesville. Dept. of Chemistry.
New Laser Dye Systems Based on Transition Metal Complexes.
Final rept. 1 Jun 78-31 May 82,
James N. Demas. 31 May 82, 13p AFOSR-TR-82-0662
Grant AFOSR-78-3590

Excited state properties of luminescent ruthenium (II) complexes and their interactions with laser dyes, other metal complexes, and oxygen have been studied in both homogeneous and surfactant containing solutions and in solid polymer matrices. Low cost experimental tools have been developed to facilitate these studies. These include a low cost temperature controller, a simple deoxygenation cell for surfactant solutions, and a low frequency computerized lockin amplifier. Also, new quantum counters for light intensity measurements have been developed. Energy transfer from ruthenium (II) complexes to a variety of rhodamine and oxazine laser dyes has been demonstrated in both homogeneous solutions and in surfactant-assisted ones. Singlet energy transfer efficiencies from the charge transfer (CT) sensitizing state of the Ru(II) complex to the laser dyes in homogeneous solutions are unity, and in surfactant-assisted systems efficiencies are 45-75% at concentrations of 10-5M.

AD-A118 815/0 PC **A02**/MF **A01**
Yale Univ., New Haven, CT.
Amplification on Relativistic Electron Beams in Combined Helical and Axial Magnetic Fields,
L. Friedland, and A. Fruchtman. 9 Jul 81, 15p Rept no. 9
Contract N00014-79-C-0588
Pub. in Physical Review A, v25 n5 p2693-2706 May 82.

No abstract available.

DE82014960 PC **A03**/MF **A01**
Princeton Univ., NJ. Plasma Physics Lab.
First Results from a Soft-X-Ray Laser Experiment in a Confined Plasma Column.
S. Suckewer, L. C. Johnson, K. Sato, A. Semet, and C. H. Skinner. Apr 82, 30p PPPL-1896
Contract AC02-76CH03073
Microfiche only after original copies are exhausted.

We present a description of the experimental set up and the first results from an experiment designed to achieve lasing action in the soft x-ray region of the spectrum. A 0.5 kJ CO sub 2 laser was focused into a target gas, typically CO sub 2 , and the resulting plasma was confined in a 50 to 90 kG magnetic field. Spectroscopic diagnostics were used to monitor the n = 7 and n = 8 level populations of CVI as well as ultraviolet emission lines of CV and CIII, for different plasma conditions. We present data showing that as the confining magnetic field was increased, the plasma column diameter decreased, the CVI 3434 line intensity (7 implies 6 transition) increased and its decay time decreased consistent with earlier computer modeling. We also discuss the effect of the low intensity tail, normally present in CO sub 2 laser pulses, on the predicted population inversion. Analysis of the experimental data by computer simulation shows the range of expected total gain on the n = 3 to n = 2 transition at 182A in these experiments was G = 0.05 to 0.1 and the possibility for its significant increase.

DE82750285 MF **A01**
Max-Planck-Inst. fuer Quantenoptik, Garching (Germany, F.R.).
Active-Passively Mode-Locked Dye Laser for Diagnosis of Laser-Produced Plasmas.
Y. L. Teng, R. Fedosejevs, and R. Sigel. Mar 81, 51p MPQ-43
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

In this report an active-passively mode-locked, flashlamp-pumped dye laser for diagnosis of laser-produced plasmas is described. This dye laser system used as a pulsed light source for high-speed photography of laser-target experiments was synchronized to the ASTERIX III iodine laser pulse with better than 100 ps accuracy. The single pulse energy was 10 mu J, pulse duration less than 10 ps. In 111 shots clear shadowgrams were obtained during a total of 151 target shots, i.e. the system worked well in 74% of the shots. (ERA citation 07:045288)

N82-29598/1 PC **A14**/MF **A01**
Science and Engineering Research Council, Chilton (England). Rutherford Appleton Lab.
Science and Engineering Research Council Central Laser Facility.
Annual Report.
Mar 81, 322p DE81-700417, RL-81-040

The major reconstruction and upgrade of the glass laser, which was undertaken to increase the versatility of the facility, is described. Work on: glass laser development, laser plasma interactions, transport and particle emission studies, ablative acceleration and compression studies, spectroscopy and XUV lasers, and theory and computation as described. Publications based on the work of the facility are listed.

PAT-APPL-6-384 292 PC **A02**/MF **A01**
Department of the Air Force, Washington, DC.
Multiple Double Heterojunction Buried Laser Device.
Patent Application,
Frank Z. Hawrylo. Filed 2 Jun 82, 18p AD-D009 638/8
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A multiple double heterojunction buried laser device is formed of a bulk structure, a plurality of double heterojunction buried lasers and electrical means. The bulk structure includes, in order, an InP:Sn substrate, an InP:Te first layer, an InP:Zn second layer, an InP:Te third layer, and a capping n-type fourth layer. Multiple stripe-like openings are formed in the above layers and double heterojunction buried lasers are formed therein. The double heterojunction buried lasers include the following layers in order: an InP:Te heterojunction first layer, an InGaAsP quarternary second layer, an InP:Zn heterojunction third layer, and an InGaAsP:Zn capping fourth layer. A reverse biased junction is formed in said bulk structure so that current is confined to the lasers; the active lasing regions are above the p-type layers of the p-n reversed bias junction. The double heterojunction buried lasers can be cleaved from the laser device and operated as a single device. (Author)

PAT-APPL-6-385 739 PC **A02**/MF **A01**
Department of the Navy, Washington, DC.
Three-Mirror Active-Passive Semiconductor Laser.
Patent Application,
Elsa M. Garmire, Gary A. Evans, and Joseph W. Niesen. Filed 7 Jun 82, 19p AD-D009 648/7
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Disclosed is a gallium arsenide laser diode wherein an abrupt etch step in the waveguide layer forms a third mirror. The structure is a large optical cavity double heterostructure laser having a relatively long active cavity and a relatively short passive cavity. Output is temperature and current sensitive for single mode operation, widely-spaced dual mode operation, and narrow-band multimode operation. (Author)

PATENT-4 330 763 Not available NTIS
Department of the Navy, Washington, DC.
Resonantly Pumped Mid-IR Laser.
Patent,
Leon Esterowitz, and Melvin R. Kruer. Filed 19 Mar 80, patented 18 May 82, 3p AD-D009 658/6, PAT-APPL-6-131 349
Supersedes PAT-APPL-6-131 349, AD-D007 072.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A solid-state laser operative in the mid infrared region (3-5 micronmeter) comprises a YLF laser including a trivalent terbium activator which is pumped by a resonant external laser source (Ho:YLF, 2.06 micronmeter

laser) to directly populate the upper laser level which achieves inversion before non-radiative decay depletes the initial laser-level population. The initial laser manifold that is externally pumped is the 7F2 manifold. Inversion is then between the 7F3 and 7F5 manifolds and laser oscillation at 4.1 micronmeter is obtained. (Author)

20F. Optics

AD-A118 620/4 Not available NTIS
Minnesota Univ., Minneapolis. Dept. of Electrical Engineering.
Spatial Frequency Pseudo-Coloring with Binary Filters,
H. Bartelt, and S. K. Case. 7 Apr 82, 4p ARO-17612.2-PH
Contract DAAG29-81-K-0033
Availability: Pub. in Optics Communications, v42 n3 p162-164, 1 Jul 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 637/8 Not available NTIS
Rochester Univ., NY. Dept. of Physics and Astronomy.
Coherent-Mode Representation of Gaussian Schell-Model Sources and of Their Radiation Fields.
A. Starikov, and E. Wolf. 5 Dec 81, 8p ARO-16814.15-PH
Contract DAAG29-80-C-0020
Availability: Pub. in Jnl. of the Optical Society of America, v72 n7 p923-928 Jul 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 645/1 Not available NTIS
Rochester Univ., NY. Dept. of Physics and Astronomy.
Effect of Backscattering in Phase Conjugation with Weak Scatterers,
G. S. Agarwal, Ari T. Friberg, and E. Wolf. 8 Feb 82, 5p ARO-16814.16-PH
Contract DAAG29-80-C-0020
Availability: Pub. in Jnl. the of Optical Society of America, v72 n7 p861-863 Jul 82 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 653/5 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Francis Bitter National Magnet Lab.
Theoretical Study of Nonlinear Surface and Inhomogeneous Processes and Their Applications to Optical Bistability.
Final rept. 1 Apr 80-15 Mar 82,
Alexander Kaplan. 13 May 82, 7p AFOSR-TR-82-0670
Grant AFOSR-80-0188

Some fundamentally novel nonlinear optical devices were proposed and experimentally realized (in collaborative experiments with P.W. Smith, W.J. Thomlinson and J. Bjorkholm at Bell Laboratories). These results have been published in fourteen papers by the principal investigator (some of them in collaboration with researchers at Bell Laboratories, Holmdel, NJ, and Max-Planck-Institute fur Quantenoptick, Garching, Germany). The unified theory of plane-wave reflection and reflection at nonlinear interfaces was considered. Excitation of inhomogeneous traveling waves, which are peculiar features for negative nonlinearity, have been studied. It was shown analytically that in the case of limited (Gaussian) beam incidence, the nonlinear surface wave, observed in some recent computer simulations, is strictly forbidden, and an approximate theory of reflection in such a case has been developed. (Author)

DE82007577 MF **A01**
Lawrence Livermore National Lab., CA.
Some Thoughts on the Role of Electroplated Coatings in Optics and Some Considerations for Their Production.
G. M. Sanger. 12 Jan 82, 33p UCRL-87084, CONF-820611-1
Contract W-7405-ENG-48
American Electroplaters Society (SUR/FIN) conference, San Francisco, CA, USA, 20 Jun 1982.
Available in microfiche only.

New and exotic applications of optics to directed energy weapons systems, advanced astrophysical, and alternative energy applications to name a few, are forcing reconsideration of the available optical materials and manufacturing processes. Metal and coated metal optics of both conventional and unconventional geometry are of particular importance in these areas due to their unique efficiency and optimal functional properties. The emerging importance of these coated metal optics will be discussed, including the types and characteristics of coatings required, the optical design process and a very short survey of the more common and important applications. Also, a perspective on the optical manufacturing technologies and their implications to the characteristics of the plated coatings is given. Finally, a short survey describing the size of the potential market for coated optics in the next decade will be presented.

N82-30074/0 PC **A06**/MF **A01**
TRW Technology Research Center, El Segundo, CA.
Integrated Optics Technology Study.
Final Report.
B. Chen. 18 Jun 82, 103p
Contracts NAS7-100, JPL-956157

The materials and processes available for the fabrication of single mode integrated electrooptical components are described. Issues included in the study are: (1) host material and orientation, (2) waveguide formation, (3) optical loss mechanisms, (4) wavelength selection, (5) polarization effects and control, (6) laser to integrated optics coupling,(7) fiber optic waveguides to integrated optics coupling, (8) souces, (9) detectors. The best materials, technology and processes for fabrication of integrated optical components for communications and fiber gyro applications are recommended.

N82-30075/7 PC **A07**/MF **A01**
TRW Technology Research Center, El Segundo, CA.
Integrated Optics Technology Study.
Final Report.
B. Chen, T. Findakly, and R. Innarella. 15 Apr 82, 134p NASA-CR-169201, NAS 1.26:169201
Contracts NAS7-100, JPL-95617
Prepared for JPL.

The status and near term potential of materials and processes available for the fabrication of single mode integrated electro-optical components are discussed. Issues discussed are host material and orientation, waveguide formation, optical loss mechanisms, wavelength selection, polarization effects and control, laser to integrated optics coupling fiber optic waveguides to integrated optics coupling, sources, and detectors. Recommendations of the best materials, technology, and processes for fabrication of integrated optical components for communications and fiber gyro applications are given.

PAT-APPL-6-399 153 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Variable Optical Attenuator.
Patent Application,
Clyde E. Lance, and Wanda S. Hutchison. Filed 16 Jul 82, 8p AD-D009 654/5
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A device is a fiber optic system for variably attenuating the signal between optical fibers consisting of two fixedly mounted optical fibers and a moveably mounted reflective surface disposed therebetween. Light emitted from the face of the first fiber strikes the reflective surface and is redirected toward the collecting face of the second fiber. That amount of redirected light which will fall incident upon the face of the second fiber, within a predetermined angle to the optical axis of the second fiber will be transmitted through the fiber and be measured by a light detector. By moving the reflective surface calibrated amounts with respect to the faces of the fixed fibers, the amount of light incident on the face of the second fiber, and thereby transmitted, can be varied, measured and controlled. (Author)

PB82-261488 Not available NTIS
National Bureau of Standards, Washington, DC.
Precision Spectroscopy and Laser Frequency Control Using FM Sideband Optical Heterodyne Techniques.
Final rept.,
J. L. Hall, T. Baer, L. Hollberg, and H. G. Robinson. 1981, 10p
Grant NSF-PHY79-04928
Pub. in Preceedings of International Conference on Laser Spectroscopy (5th), Jasper, Alberta, Canada, 29 June-3 July, 1981, p15-24.

The new hybrid rf/optical technique of FM sideband optical heterodyne spectroscopy is considered. A simple theory is given for the expected line shapes and compare with precise experimental data taken in I2 and in HF. Use of the technique for laser stabilization is also reported.

PB82-261702 Not available NTIS
National Bureau of Standards, Washington, DC.
Optical Constants of (001) Niobium in the Visible Region.
Final rept.,
J. J. Carroll, S. T. Ceyer, and A. J. Melmed. May 82, 3p
Pub. in Jnl. Optical Society of America 72, n5 p668-670 May 82.

Optical constants, measured ellipsometrically at wavelengths between 400.0 and 632.8 nm, are reported for atomically clean (00) niobium. The results are compared to literature values.

PB82-875873 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Optical Beam Splitters. July, 1972-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for Jul 72-Sep 82.
Sep 82, 180p
Supersedes PB81-881575.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning techniques and applications of beam splitters as used in beam optics. The applications of beam splitters in interferometers and display, monitoring, and measuring devices are included. (This updated bibliography contains 186 citations, 24 of which are new entries to the previous edition.)

PB82-876194 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aspherical Lenses: Preparation and Applications. 1975-September, 1982 (Citations from the International Information Service for the Physics and Engineering Communities Data Base).
Rept. for 1975-Sep 82.
Sep 82, 155p
Supersedes PB81-870966.

This bibliography contains citations concerning the applications of aspherical lenses to holographic and infrared devices, as well as to fiber optics, ultrasonics, and lasers. Special emphasis is placed on solar collectors. Methods for lens and mirror preparation are also included. (This updated bibliography contains 145 citations, 35 of which are new entries to the previous edition.)

20G. Particle Accelerators

AD-A118 515/6 PC **A07**/MF **A01**
North Carolina State Univ. at Raleigh. Dept. of Physics.
Observations of Collective Ion Acceleration.
Interim rept.,
David Lee Morrow. 1981, 131p AFOSR-TR-82-0641
Grant AFOSR-80-0051

Linear collective acceleration of protons by a relativistic electron beam (0.5 MeV, 50 kA, 60 ns) was explored in the vacuum diode and vacuum drift tube. Nylon meshes, polyethylene films, and nylon filaments as proton sources were tested along with the variation of cathode-anode-target spacings. Target activation was used to compare the various arrangements and to yield information concerning proton energies,

amounts, and spatial distributions. Proton energies in excess of 7 MeV (12 times the electron energy) were produced with filaments in 30 cm long drift tubes. A few times 10 to the 10th power particles were accelerated at this level. Activation was localized to a target spot and an axial streak on the drift tube wall. Electron beam behavior in the drift tube was examined with a Rogowski coil to measure the current and PIN diodes to measure bremsstrahlung. In addition, the periodic activation of dielectric cathodes by radially accelerated protons is reported. (Author)

AD-A118 581/8 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
Injection of a High Current Beam into a Modified Betatron Accelerator.
Memorandum rept.,
C. A. Kapetanakos, P. A. Sprangle, and S. J. Marsh.
25 Aug 82, 16p Rept no. NRL-MR-4835

A method is proposed for injecting and trapping a high current, high energy, nonneutral electron beam into a modified betatron accelerator. The injection is substantially simplified as a result of the balancing of two effects that are prominent in high current beams. (Author)

AD-A118 664/2 PC **A03**/MF **A01**
North Carolina State Univ. at Raleigh. Dept. of Physics.
Intense Relativistic Electron Beam Investigations.
Final rept. 1 Oct 79-30 Sep 81,
Wesley O. Doggett. Sep 81, 34p AFOSR-TR-82-0657
Grant AFOSR-80-0051

'Intense Relativistic Electron Beam Investigation', was reported in the 'Interim Scientific Report to the AFOSR for the period October 1, 1979 to September 30, 1980' and is herewith included by reference as part of this final report. Progress during the second (final) year of this contract is reported herein. In particular the following topics are discussed: (a) collective ion acceleration experiments using relativistic electron beams and localized ion sources produced by thin films, filaments, puffed gases and vaporization of small diameter wires; and (b) electron beam quality studies experiments in collaboration with Drs. Robert K. Parker and V. L. Granatstein at the Naval Research Laboratory with the objective of obtaining 'cool' beams propagating in vacuum in an axial magnetic field with minimum energy spread for such applications as the free electron laser.

AD-A118 755/8 PC **A09**/MF **A01**
Mission Research Corp., Albuquerque, NM.
FX-25 and FX-100 Propagation Experiments.
Summary of annual rept.,
C. A. Ekdahl, L. A. Wright, T. P. Hughes, and B. B. Godfrey. Jul 82, 192p Rept no. AMRC-R-391
Contract F49620-81-C-0016
Original contains color plates: All DTIC and NTIS reproductions will be in black and white.

Initial measurements of the hose-stable propagation pressure window and the beam current density distribution have been made using the beam produced by the FX-100 accelerator (1.5 MeV, 40 kA, and 120-ns pulsewidth). Many of the diagnostics for these measurements were developed using the beam from the FX-25 accelerator (1.5 MeV, 23 kA, and 20-ns pulsewidth). The FX-100 was decommissioned in August 1981, and the propagation experiments will continue using the beam from an accelerator (VISHNU) presently under construction for this purpose. The VISHNU beam is designed to have the same kinetic energy and current as the FX-100 beam (1.5 MeV and 40 kA), but with a much shorter pulsewidth (approx. 26 ns). Therefore, the transition to VISHNU should not involve a lengthy delay in the program, because we will be able to estabiish the propagation pressure window and current distribution evolution based on our experience with the FX-100 beam. We present here a brief account of the experiments performed and results obtained in the first year of this research. Following this we give the particulars of the FX-100 experiments and results, and the technical specification of the VISHNU accelerator. Details of the FX-25 experiments are to be found in App. A.

DE82009147 MF **A01**
Lawrence Livermore National Lab., CA.
Investigation into the Repetition-Rate Limitations of Magnetic Switches.
D. L. Birx, L. L. Reginato, and J. A. Schmidt. 10 Feb 82, 17p UCRL-87278, CONF-820626-1
Contract W-7405-ENG-48
15. power modulator symposium, Baltimore, MD, USA, 14 Jun 1982.
Best available copy from document source. Available in microfiche only.

The use of magnetic switches to generate high power pulses has opened up a whole new spectrum of possibilities. Here we describe an investigation into the maximum repetition rates possible with these devices.

DE82013765 PC **A07**/MF **A01**
Los Alamos National Lab., NM.
Fifteenth LAMPF Users Group Meeting.
D. R. F. Cochran. Mar 82, 137p LA-9260C, CONF-811188-
Contract W-7405-ENG-36
15. LAMPF users group meeting, Los Alamos, NM, USA, 2 Nov 1981, Portions of document are illegible. Microfiche only after original copies are exhausted.

The Fifteenth LAMPF Users Group Meeting was held November 2-3, 1981 at the Clinton P. Anderson Meson Physical Facility. The program of papers scheduled to be presented was amended to include a Report from Washington by Clarence R. Richardson, US Department of Energy. The general meeting ended with a round-table working group discussion concerning the Planning for a Kaon Factory. Individual items from the meeting were prepared separately for the data base. (ERA citation 07:044510)

DE82014192 MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Unique Furnace System for High-Energy-Neutron Experiments.
N. F. Panayotou, D. R. Green, and L. S. Price. Mar 82, 15p HEDL-SA-2603-FP, CONF-820406-10
Contract AC06-76FF02170
Topical meeting on fast, thermal and fusion reactor experiments, Salt Lake City, UT, USA, 12 Apr 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The low flux of high energy neutron sources requires optimum utilization of the available neutron field. A furnace system has been developed in support of the US DOE fusion materials program which meets this challenge. Specimens positioned in two temperature zones just 1 mm away from the outside surface of a neutron window in the furnace enclosure can be irradiated simultaneously at two independent, isothermal (+- 1 exp 0 C) temperatures. The temperature difference between these closely spaced isothermal zones is controllable from 0 to 320 exp 0 C and the maximum temperature is 400 exp 0 C. The design of the system also provides a controlled specimen environment, rapid heating and cooling and easy access to heaters and thermocouples. This furnace system is in use at the Rotating Target Neutron Source-II of Lawrence Livermore National Laboratory. (ERA citation 07:044494)

DE82014275 MF **A01**
Fermi National Accelerator Lab., Batavia, IL.
Versatile Secondary Beam for the Meson Area.
T. Kirk. Mar 82, 31p FNAL-TM-1098
Contract AC02-76CH03000
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

A new secondary beam design is outlined for the Meson M6 Beamline that combines versatility with economy. The beamline described will transport charged particles of either sign to 800 GeV/c and bring the beam to a focus in one of three potential experimental areas. The plan makes maximal use of existing civil construction.

DE82014395 MF **A01**
Stanford Linear Accelerator Center, CA.
Microprocessor-Controlled Phase-Measurement System for 2856-MHz Pulses.
J. D. Fox, and H. Schwarz. Apr 82, 3p SLAC-PUB-2902, CONF-820639-1
Contract AC03-76SF00515
IEEE MTTS international microwave symposium, Dallas, TX, USA, 15 Jun 1982, Portions of document are illegible.
Available in microfiche only.

A computer controlled phase detection system used to measure and stabilize the phase of high power rf pulses in the two mile Stanford Linear Accelerator has been developed. This system measures the phase of a 1 mu sec 2856 50 MW rf pulse with respect to a CW reference signal at the same frequency at a 180 Hz rate with < 0.2 exp 0 resolution. (ERA citation 07:044515)

DE82701715 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Elements of the System for RF Power Input into Linear Accelerator-Injector for Booster.
E. V. Mazurov, I. G. Mal'tsev, and I. M. Shalashov. 1981, 9p IFVE-OI-81-20
In Russian.
U.S. Sales Only.

The elements of the original system for rf power input into 30 MeV linear accelerator-injector for the IHEP proton synchrotron booster are considered. A 3 dB coaxial directional coupler (T-bridge) is described. The characteristics of the bridge containing elements and the parameters of ballast matched load are given. (Atomindex citation 13:665374)

DE82701716 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
Study on Ion Source with Cathode Sputtering of a Working Matter by the Optical Method.
Yu. P. Tret'yakov. 1980, 7p JINR-R-7-80-641, CONF-8010270-
In Russian.All-union seminar physics and techniques of intensive sources of ions and ion beams, Kiev, Ukrainian SSR, 1 Oct 1980.
U.S. Sales Only.

Optical spectra of a discharge in a multicharged ion source of Penning type with indirectly heated cathode were measured using the DFS-8 spectrograph. The working matter (milibdenum) was supplied by the cathode sputtering method. The measurements are carried out via the longitudinal and transverse slits in the discharge chamber, xenon being a supporting gas. Considering Mo1-Mo6 and Xe1-Xe4 spectral line intensity distributions permits to draw the following conclusion: the effective extraction from the ion source of ions of sputtered matter is successful in the case when the electrode being sputtered is introduced into the discharge chamber on a level of emission slit and its height corresponds to that of a slit. (Atomindex citation 13:665423)

DE82701719 PC **A03**/MF **A01**
Akademiya Nauk URSR, Kharkov. Fiziko-Tekhnicheskii Inst.
EMITRA-Program for Mathematical Simulation of Charged Particle Beam Dymnamics in Linear Accelerators and Beam Transport Systems.
V. I. Artemov, A. N. Dovbnya, and F. A. Peev. 1981, 36p KFTI-81-16
In Russian.
U.S. Sales Only.

The EMITRA-program for simulation of electron (positron) beam dynamics in linear accelerators and transport systems is described. The program is written in FORTRAN for BESM-6 computer, the graphic program complex GRAFOR is used. The program algorithm is considered. The simulation is based on trajectory method. The interconnection between particle energy and phase is taken into account, which is due to nonisochronous character of particle trajectory as well as its slippage relative to the accelerating wave. Calculation results may be printed out in the form of tables or graphs. The instruction on usage and a simulation example for the channel containing specific elements of the linear accelerator: drift graphs, quadrupole lenses, accelerating sections with and without solenoid are given. (Atomindex citation 13:665426)

DE82701722 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Sukhumi. Fiziko-Tekhnicheskii Inst.
Ion Collective Acceleration by an Electron Beam in a Conical Waveguide.
A. K. Gevorkov, and T. R. Soldatenkov. 1980, 19p SFTI-9(1980)
In Russian.
U.S. Sales Only.

A possibility of ion acceleration by a space charge wave in a noncompensated electron beam under conditions, when both a wave amplitude increase and a

phase velocity change are defined by external factors, is considered. For ion acceleration it is proposed to use a slow wave excited in the electron beam-waveguide system with finite wall conductivity. Acceleration system consists of the noncompensation electron beam passing through a strong magnetic field and accelarating by the ion beam with the density less than the electron beam density. The wave phase velocity increase is attained by changing the beam velocity while passing through a converent waveguide, where with the waveguide radius change a longitudinal electric field accelerating the beam electrons exists. Synchronism between ions captured in the acceleration process and the wave is provided by the profiled waveguide radius variation. To amplify the wave it is proposed to use a well-known "wall" instability, appearing in case of the finite waveguide wall conductivity. It is shown that init:al modulation in the beam will increase with the distance and the amplitude will also increase. Such an amplifier does not require introduction of external power, and the wave amplitude increase is caused by the beam energy. It is noted that when the cynchronism conditions for the wave velocity and ion velocity are satisfied the. (Atomindex citation 13:665441)

DE82750127 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Mini-beta II.
H. Newman. Jun 81, 30p DESY-81/031
U.S. Sales Only. Available in microfiche only.

An improved mini-beta system has been found which uses readily available conventional quadrupoles, and its properties and limitations have been investigated. A four-fold symmetric arrangement matched to MI8 optics is assumed. The new quadrupole arrangement is flexible and adaptible to PETRA operation at beam energies up to 23 GeV; minor adjustments of the system can be made to reduce the chromaticity (or increase the luminosity) over a broad range. The relationship between the linear chromaticity xisub(z) and the luminosity gain relative to the present mini-beta set up is roughly linear, and it is not sensitive to the absolute k-values of the quadrupoles. The luminosity gain may be as high as a factor of two, but it depends critically on the maximum tolerable chromaticity and the assumed machine acceptance. (ERA citation 07:044522)

DE82750268 MF **A01**
Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.).
Effects in Heavy-Ion Radiation Damage on Target Lifetimes in UNILAC Experiments.
I. Maor. Aug 81, 28p GSI-81-9
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

This work is mainly the result of a literature research on effects of radiation damage occurring in targets commonly used in heavy-ion bombardments. Concepts and models for the description of radiation damage effects in solids as well as experimental methods for the quantitative characterization of such effects are reviewed. Some of these concepts are applied to the practical case of bombardments of exp 248 Cm-metal targets or refractory element substrates with high-intensity beams of approx. equal to 7 MeV/n exp 238 U-ions. Experimental observations during these bombardments, evaluation of macroscopic properties of the bombarded targets, as well as results from simulations of the bombarding conditions by electron-beams and low-energy heavy-ion beams are reported. This results in several conclusions concerning the limited life-time of the exp 248 Cm-targets and suggestions for future tests and target modifications. (ERA citation 07:044493)

DE82903258 MF **A01**
Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati.
Preparation and Study of Implanted Nitrogen Ions for Nuclear Physics Experiments.
G. Ciavola, G. Lanzano, A. Palmeri, and A. Trovato. 22 Apr 81, 10p INFN/TC-81/8
In Italian.Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

exp 14 N and exp 15 N targets have been obtained by ion implantation in thick Tantalum foils. The implanted ions covered uniformly a surface typically of 1 cm x 1 cm, the thickness was limited to 0.5 x 10 exp 18 atoms/cm exp 2 . (ERA citation 07:047810)

PB82-259870 PC **A07**/MF **A01**
Institute of Physical and Chemical Research, Saitama (Japan).
Scientific Papers of the Institute of Physical and Chemical Research, Volume 75, Number 4, December 1981.
Quarterly rept.,
Rikagaku Kenkyusho. Dec 81, 149p PAPER-1938
Also pub. in ISSN-0020-3092.

Contents: Computer simulation of cluster production by a slit-throat nozzle; Isochronous magnetic field in a Separated-Sector Cyclotron and the effect of field imperfection; Calculation of RF electromagnetic field by finite element method; Design and model study of injection bending magnet for the RIKEN SSC; Model study of magnetic inflection channel for the RIKEN SSC; Design of injection and extraction harmonic coils for the RIKEN SSC; Beam transport system for the RIKEN SSC; The RIKEN SSC beam handling system; XPS studies of the Pt/TiO2 and Pt/ZnO catalysts used for methanol decomposition under UV irradiation.

PB82-261009 PC **A03**/MF **A01**
Nationaal Inst. voor Kernfysica en Hoge-Energiefysica, Amsterdam (Netherlands). Mechanical Technological Group.
A Design Study of the Vacuum System of the Daresbury X-8 Experimental Line. Part 1: The Front-End System,
J. F. J. van den Brand. Mar 82, 34p MTG-17

This paper deals with the front-end vacuum system of the X 8 beam line at the Daresbury synchrotron radiation source. The vacuum system is represented by a matrix to allow calculation of pressure profiles for many sets of pumping-speed and desorption parameters. It is shown that, for a mass spectrum consisting mainly of CO and N2, it is possible to operate the machine side of the front-end system in the 10 to the -10th power Torr pressure region, and proof is given that the two conductance-stage can provide a pressure difference of 1:100.

20H. Particle Physics

DE82008231 MF **A01**
California Univ., Riverside.
Search for Charmed-Meson Production in Proton-Proton Collisions at the CERN-ISR.
G. J. VanDalen. Mar 78, 215p DOE/ER/70107-T2
Contract AT03-76ER70107
Thesis. Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Experimental results on a search for D exp 0 (1865) mesons produced at y approx. 1.0 in proton - proton collisions at the center of mass energy of 53 GeV are presented here. Cross section upper limits of 8 mu barns and 9 mu barns at the 95% confidence level were measured for the processes p + p implies D exp 0 + X,D exp 0 implies K exp - + pi exp + and p + p implies anti D exp 0 + X, anti D exp 0 implies K exp + + pi exp - respectively. In addition production of f exp 0 (1270), g exp 0 (1680) and K* exp 0 (1420) have been observed. (ERA citation 07:055405)

DE82008366 MF **A01**
Oregon Univ., Eugene. Inst. of Theoretical Science.
Determination of Kaon and Valon Structures from Soft Hadronic Processes.
L. Gatignon, R. C. Hwa, and R. T. Van de Walle. Aug 81, 12p DOE/ER/70004-316
Contract AT06-76ER70004
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The low-p/sub t/ data of the K exp + p BEBC experiment at 70 GeV/c have been analyzed within the framework of the valon model. The p implies pi exp - cross section is first used to determine the parton distribution in a valon. The result is then used to make a prediction for the p implies pi exp + distribution without free parameters; the agreement is satisfactory. The corresponding nu W sub 2 has an effective Q exp 2 approx. 1 (GeV) exp 2 . From the K exp + implies K/sup n/ data, we determine the valon distributions in a kaon and the parton distributions in the strange valon. The quark distributions in a kaon are then exhibited.

DE82011280 MF **A01**
Minnesota Univ., Minneapolis. School of Physics and Astronomy.
Nuclear Structure Studies with Pions and Light and Heavy Ions. Progress Report, June 1, 1981-May 31, 1982, and Proposal Update, June 1, 1982-May 31, 1983.
D. Dehnhard. Jan 82, 71p DOE/ER/10423-5
Contract AS02-79ER10423
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Three experiments on pion inelastic scattering were performed during the last year at the Los Alamos Meson Physics Facility. Data reduction for the exp 14 C experiment is complete and new information on the M4 strength in this nucleus was extracted. Data reduction for the exp 16 O and exp 17 O experiments is underway. Theoretical analyses of earlier data were continued and work on a consistent description of (pi , pi '), (e,e'), and (p,p') experiments on exp 16 O and exp 13 C proved to be very encouraging. In an experiment at the Swiss Institute for Nuclear Research (pi , pi ' gamma) angular correlation data were taken for the first time. The results support present theories on the importance of delta -nucleus dynamics in pion scattering.

DE82011519 MF **A01**
Brookhaven National Lab., Upton, NY.
Antiproton Physics in the Next Decade.
C. B. Dover. Feb 82, 31p BNL-30865, CONF-820225-1
Contract AC02-76CH00016
Los Alamos meson physics facility II workshop, Los Alamos, NM, USA, 1 Feb 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Notes from a talk at the LAMPF II workshop are given. Topics include antinucleon physics in the next decade - the role of anti p and anti n beams in shedding light on some fundamental problems in nuclear and particle physics. Some particle aspects considered include; a) anti n as a source of antiquarks (anti NN provides a well-suited entrance channel for formation of new kind of mesons), and b) possibility of forming quark-gluon phase in anti N annihilations in nuclei. Some nuclear aspects discussed include: a) medium and long range parts of NN and anti NN potentials related by G-parity, b) search for coherent tensor forces in anti NN spin observables, and c) quasi-molecular resonance phenomena in anti NN and anti N-nucleus systems.

DE82011582 MF **A01**
Pittsburgh Univ., PA. Dept. of Physics.
Some Prospects for Antiproton Physics.
R. A. Eisenstein. 1982, 18p DOE/ER/03244-91, CONF-820225-3
Contract AS02-76ER03244
Los Alamos meson physics facility II workshop, Los Alamos, NM, USA, 1 Feb 1982, Portions of document are illegible.
Available in microfiche only.

Some of the possibilities for fruitful research with antiprotons are outlined below. Special emphasis is placed on the possibility of learning about quark spectroscopy and dynamics using highly precise and intense anti p beams such as LEAR. It is urged that any discussion of LAMPF II give very careful consideration to the construction of a facility competitive with LEAR.

DE82012911 MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Statistical Fluctuations in Heavy-Ion Collisions.
L. G. Moretto. Feb 82, 29p LBL-14137, CONF-8110165-3
Contract AC03-76SF00098
International symosium on nuclear fusion and related collective phenomena, Bad Honnef, F.R. Germany, 26 Oct 1981, Portions of document are illegible.
Available in microfiche only.

The relevance of the statistical equilibrium limit to the description of substantially relaxed degrees of freedom is discussed. Fluctuations are considered specifically in the following processes: the correlation be-

tween entrance-channel angular momentum and exit-channel kinetic energy; the sharing of the dissipated kinetic energy between the two fragments; the magnitude and the alignment of the fragment angular momentum including the effect of shell structure. It is found that statistical fluctuations play a major role and that the statistical equilibrium limit seems to have been reached for a number of degrees of freedom. (ERA citation 07:048601)

DE82012939 MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Overview of Very-High-Energy Heavy Ions.
H. G. Pugh. 1981, 14p LBL-12835, CONF-8106219-1
Contract AC03-76SF00098
Inter-regional program for very high energy heavy ions, Copenhagen, Denmark, 10 Jun 1981.
Best available copy from document source. Available in microfiche only.

This review gives a capsule summary of some background facts and basic considerations relevant to possible use of the CERN ISR for experiments with light ions.

DE82014131 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Radiative Capture of Fast Neutrons by exp 165 Ho and exp 238 U.
D. K. McDainels, P. Varghese, D. M. Drake, E. Arthur, and A. Lindholm. Apr 82, 9p LA-9093-MC
Contract W-7405-ENG-36
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Radiative capture of fast neutrons by the deformed nuclei exp 165 Ho and exp 238 U was measured over the 7- to 15-MeV incident neutron energy range. The gamma -ray detector was a large NaI(T1) anti-Compton spectrometer, and time-of-flight techniques were used to suppress background. The total radiative capture cross section exhibits an energy dependence that clearly indicates the importance of the direct-semidirect reaction mechanism. Theoretical calculations compare favorably with experimental observations. However, the shapes of the observed gamma -ray spectra differ from those calculated, indicating problems in estimating the distribution of single-particle strength for these deformed nuclei. (ERA citation 07:045159)

DE82014439 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Particle Angular Distributions and gamma-Ray Multiplicities as Experimental Probes for Angular-Momentum Fluctuations.
L. G. Moretto. Mar 82, 65p LBL-14101, CONF-820149-1
Contract W-7405-ENG-48
20. international meeting on nuclear physics, Bormio, Italy, 25 Jan 1982.

The sequential emission of exp 4 He is demonstrated in the reaction Ho + Ta and the exp 4 He angular distribution is used to test the rigid rotation limit in the reaction Ho + Ag. A more refined analysis of the dependence of continuum gamma -ray multiplicities upon Q-value and gamma ray energy shows that reasonable agreement with the statistical model is obtained if one assumes the presence of low energy aligned dipole transitions in the reactions Ho, Yb, Sm, Ag + Ho. Sequential fission angular distributions from very asymmetric reactions U, Au + Ne provide a severe test for the statistical model.

DE82014868 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Photonuclear Reactions at Lawrence Livermore National Laboratory.
B. L. Berman. May 82, 24p UCID-19391
Contract W-7405-ENG-48
Microfiche only after original copies are exhausted.

Since the 1980 Gordon Conference on photonuclear reactions, 18 papers have been published and four more have been submitted for publication from LLNL. A listing of these is given as well as six abstracts that report results not represented in the published or submitted papers. Short summaries of work currenoly in progress, interspersed with figures of representative data are presented.

DE82015039 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Number of Detectable Kaon Decays at LAMPF II.
T. W. L. Sanford. Apr 82, 23p LA-9334-MS
Contract W-7405-ENG-36

The maximum number of kaon decays detectable at LAMPF II is estimated for both in-flight and stopping decays. Under reasonable assumptions, the momentum of the kaon beam that optimizes the decay yield occurs at about 6 GeV/c and 600 MeV/c for in-flight and stopping decays, respectively. K exp + decay yields are fo the order of 7 x 10 exp 7 per 10 exp 14 interacting with K exp - yields being typically 5 times less. By measuring decays from such beams, a statistical limit of 10 exp -15 on a branching ratio to a particular channel can be placed in a 100-day run. The large number of kaon decays available at LAMPF II thus provides a powerful tool for sensitively examining rare-decay processes of the kaon.

DE82015080 PC **A02**/MF **A01**
Los Alamos National Lab., NM.
Importance of Elastic Scattering to Particle Direction Determination in Monte Carlo Calculations of DT Reactions in Flight.
J. J. Devaney. Apr 82, 16p LA-9306-MS
Contract W-7405-ENG-36

The importance of single, large-angle, nuclear-coulombic, nuclear-hadronic, hadronic-coulombic interference, and multiple nuclear-coulombic scattering is investigated for tritons incident on deuterium, iron, and plutonium for very high temperatures and densities and for ordinary liquid and solid densities at low temperature. Depending on the accuracy desired, we conclude that for 10-keV-temperature DT plasmas it is not necessary to include elastic scattering deflection in reaction-in-flight calculations. For higher temperatures or where angular accuracies greater than 10 exp 0 are significant or for higher Z targets or for other special circumstances, one must include elastic scattering from coulomb forces.

DE82016013 PC **A03**/MF **A01**
Lawrence Livermore National Lab., CA.
Current Status of Fast-Neutron-Capture Calculations.
D. G. Gardner. 15 Apr 82, 49p UCRL-87438, CONF-820438-3
Contract W-7405-ENG-48
NEANDC/NEACRP specialists meeting on fast-neutron capture cross sections, Argonne, IL, USA, 20 Apr 1982.

This work is primarily concerned with the calculation of neutron capture cross sections and capture gamma-ray spectra, in the framework of the Hauser-Feshbach statistical model and for neutrons from the resonance region up to several MeV. An argument is made that, for applied purposes such as constructing evaluated cross-section libraries, nonstatistical capture mechanisms may be completely neglected at low energies and adequately approximated at high energies in a simple way. The use of gamma-ray strength functions to obtain radiation widths is emphasized. Using the reaction exp 89 Y + n as an example, the problems encountered in trying to construct a case that could be run equivalently on two different nuclear reaction codes are illustrated, and the effects produced by certain parameter variations are discussed. (ERA citation 07:045138)

DE82750142 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Search for New Sequential Leptons in E exp + E exp - Annihilation at PETRA Energies.
R. Brandelik, W. Braunschweig, K. Gather, V. Kadansky, and F. J. Kirschfink. Nov 80, 9p DESY-80-108
U.S. Sales Only. Available in microfiche only.

We have searched for new heavy leptons produced in e exp + e exp - annihilations at c.m. energies up to 36.6 GeV. The existence of a sequential lepton with a mass less than 15.5 GeV can be excluded with 95% C.L. This conclusion is almost independent of the lepton's decay properties. (ERA citation 07:044930)

DE82750143 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Observation of QCD Effects in Transverse Momenta of E exp + E exp - Jets.
C. Berger, H. Genzel, R. Grigull, W. Lackas, and F. Raupach. Nov 80, 8p DESY-80-111
U.S. Sales Only. Available in microfiche only.

Probability distributions of the total transverse momenta (K) of charged particles produced in hadronic jets in e exp + e exp - annihilations have been measured for center of mass energies in the range from 9.2 to 31.6 GeV. A linear increase of the average K exp 2 with Q exp 2 is observed. The data are successfully compared with high order QCD predictions according to a simple qq picture supplemented by multiple emission of soft gluons). Deviations from this picture at the highest energies and large K are then analyzed in terms of hard gluon bremsstrahlung and qualitative agreement is found with first order QCD predictions. Scaling 'in the mean' is found to be valid both for jet and single particle transverse momenta. (ERA citation 07:044931)

DE82750144 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Experimental Test of Electroweak Effects at PETRA Energies.
C. Berger, H. Genzel, R. Grigull, W. Lackas, and F. Raupach. Nov 80, 9p DESY-80-116
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The differential cross sections for Bhabha scattering and mu pair production, and the total tau pair cross section as measured by the PLUTO detector at PETRA, have been analysed to extract information on the weak interaction of leptons. The data are compared with unified gauge theories. Since the observed electroweak effects are still consistent with zero (within errors) we can set experimental limits on neutral current parameters at Q exp 2 values of 950 GeV exp 2 . In the framework of the standard SU (2) x U (1) model we find sin exp 2 sub(w) 0.52 (95% c.1.). In the context of general single 2 exp 0 models we can exclude Z exp 0 masses of less than 40 GeV. (ERA citation 07:044932)

DE82750145 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Topology of the T-Decay.
C. Berger, W. Lackas, F. Raupach, G. Alexander, and J. Buerger. Dec 80, 32p DESY-80-117
U.S. Sales Only. Available in microfiche only.

Multihadron events resulting from e exp + e exp - annihilation at the T-resonance are analysed with respect to lowest order QCD which predicts a dominant T decay into three vector gluons. Smearing effects due to the gluon fragmentation are so large, however, that no clear 3-jet structure or flatness is expected in the hadron final state. Instead, Monte Carlo simulations predict event structures with thrust and triplicity distributions distinctly different from those of two quark-jet and of phase with the 3-vector gluon decay as predicted by QCD and exclude dominantly phase space like or 2-quark jet decays. Also, the decay into scalar gluons is excluded by the data. An upper limit for the T-decay into one photon and two gluons is obtained. (ERA citation 07:044933)

DE82750146 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Evidence for Charged Primary Partons in E exp + E exp - Implies 2 Jets.
R. Brandelik, W. Braunschweig, K. Gather, V. Kadansky, and F. J. Kirschfink. Jan 81, 9p DESY-81-005
U.S. Sales Only. Available in microfiche only.

A study of the product of momentum-weighted jet charges in e exp + e exp - implies 2 jets as well as a detailed investigation of the charge compensation mechanism in rapidity space yield clear evidence for the presence of short range and long range charge correlations. The long range correlations show that the leading particles in one jet 'know' about the charge of the leading particles in the opposite jet. If the jets are produced from initial parton pairs this observarion implies that these partons are charged. (ERA citation 07:044937)

DE82750147 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).

Measurement of E exp + E exp - Implies E exp + E exp - and E exp + E exp - Implies gamma gamma at Energies Up to 36.7 GeV.
W. D. Apel, J. Bodenkamp, D. Chrobaczek, J. Engler, and H. J. Behrend. May 81, 9p DESY-81-021, KFK-3183
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The differential cross sections of the reactions e exp + e exp - implies e exp + e exp - and e exp + e exp - implies gamma gamma are measured at energies between 33.0 and 36.7 GeV. The results agree with the predictions of quantum electrodynamics. A comparison with the standard model of electroweak interaction yields sin exp 2 THETAsub(w) = 0.25 +- 0.13. (ERA citation 07:044940)

DE82750148 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Baryon Production in E exp + E exp - -Annihilation at PETRA.
W. Bartel, D. Cords, P. Dittmann, R. Eichler, and R. Felst. Jun 81, 6p DESY-81/028
U.S. Sales Only.

Data on anti p and anti lambda production by e exp + e exp - -annihilation at CM energies between 30 and 36 GeV are presented. Indication for an angular anticorrelation in events with baryon antibaryon pairs is seen. (ERA citation 07:044941)

DE82750149 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Search for Narrow Quarkonium States and Pair Production of New Heavy Quarks at C.M. Energies from 33.0 to 36.7 GeV.
W. D. Apel, J. Bodenkamp, D. Chrobaczek, J. Engler, and H. J. Behrend. Jun 81, 7p DESY-81/029
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The total e exp + e exp - annihilation cross section into hadrons has been measured at c.m. energies between 33.00 and 36.72 GeV in steps of 20 MeV. The average ratio R = sigma(e exp + e exp - implies hadrons)/sigmasub(mu)sub(mu) = 3.85 +- 0.12 (stat.) +- 0.31 (syst.) is consistent with the quark-parton model expectation for coloured u, d, s, c, and b quarks. For a narrow Jsup(P) = I exp - quarkonium state of a hypothetical t quark of charge 2/3 e, we find an upper limit GAMMAsub(e)sub(e) x GAMMAsub(had)/GAMMAsub(tot) < 2.2 keV at 95% c.l.. The observed number of aplanar final states excludes a contribution to R of 4/3 from a new quark with a mass between 6 and 16.5 GeV, and a contribution of 1/3 for quark masses between 9 and 16.5 GeV. (ERA citation 07:044942)

DE82750150 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Tests of QED Abd Electroweak Theories at PETRA.
V. Hepp, and P. Dittmann. Jun 81, 42p DESY-81/030
U.S. Sales Only. Available in microfiche only.

We review experimental results from PETRA on the reactions: e exp + e exp - implies e exp + e exp - , mu exp + mu exp - , tau exp + tau exp - and gamma gamma at centre-of-mass energies up to 36.7 GeV. The data are compared with the predictions of quantum electrodynamics and electroweak theories. The implication of the total cross section measurements for e exp + e exp - implies qanti q implies hadrons with respect to the weak mixing angle is discussed. (ERA citation 07:044943)

DE82750151 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Investigation of High Psub(T) Jets in Two-Photon Interactions.
D. Cords. Jun 81, 12p DESY-81/033
U.S. Sales Only. Available in microfiche only.

The experiments JADE, PLUTO, and TASSO at the PETRA storage ring have searched for 2-jet-like processes in two-photon interactions. Events with a characteristic 2-jet topology have been observed and it is found that the point-like gamma gamma implies qanti q cross section is approached from above at large transverse momenta of the jets. (ERA citation 07:044944)

DE82750152 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Lambda ,Anti lambda Production in E exp + E exp - Annihilation at 33 GeV Centre of Mass Energy.
R. Brandelik, W. Braunschweig, K. Gather, F. J. Kirschfink, and K. Luebelsmeyer. Jun 81, 9p DESY-81-039
U.S. Sales Only.

Differential cross sections for lambda , anti lambda production have been measured in e exp + e exp - annihilation at 33 GeV in the momentum range from 1 to 10 GeV/c. New results for K exp 0 , anti K exp 0 production at this energy are also presented and we show that the x-dependence of the scaling cross section (s/ beta) dsigma/dx is similar for lambdas and kaons over the whole x range measured. The sum of lambda and anti lambda production was found to be 0.28 +- 0.04 (statist. error) +- 0.04 (syst. error) per event which yields a value Rsub(lambda ,anti lambda) = 1.12 +- 0.15 +- 0.17. (ERA citation 07:044945)

DE82750153 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Review of E exp + E exp - Experiments with PLUTO from 3 to 31 GeV.
L. Criegee, and G. Knies. Jul 81, 127p DESY-81-044
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The contributions of the PLUTO experiment to e exp + e exp - physics at collision energies in the range of 3-31 GeV are reviewed. The review briefly sketches the storage rings DORIS and PETRA at DESY, and describes the most important features of the PLUTO detector, of data processing, and of the analysis methods. It covers the physics results in the fields of electroweak interactions, of the heavy lepton tau and the search for still heavier leptons, of hadron production with evidence for quark and gluon jets, as well as multiparton effects, of UPSILON decays and their relation to QCD, and concludes with first results in high-energy photon-photon interactions. (ERA citation 07:044946)

DE82750154 PC **A06**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.). Inst. fuer Kernphysik.
Cross Section and Panti p Invariant Mass Distribution of the Reaction gamma p Implies Panti Pp at 4.74-6.55 GeV, an Experimental Investigation.
Diss,
J. Bodenkamp. Aug 81, 111p KFK-3179
In German.
U.S. Sales Only.

This paper gives a report of a photoproduction experiment of proton-antiproton pairs on hydrogen in the elastic reaction gamma p implies panti pp which was performed at the Deutsches Elektronensynchrotron in Hamburg. The results of our measurements do not show substantial energy dependence in the energy range in our experiment. We obtain an integrated cross section of 79.6 +- 6 nbarn for the investigated reaction. Data accumulations could be observed in the invariant mass distribution of the proton antiproton pairs at 1940 MeV/c exp 2 and 2020 MeV/c exp 2 . The signal at 2020 MeV/c exp 2 has a statistical significance of 3.5 standard deviations and is in agreement with a resonance of the panti p-system reported in earlier experiments, a Breit-Wigner fit to the data yielded for mass msub(o) and width GAMMAsub(o) of this signal m sub 0 = 2.023 +- .005 GeV/c exp 2 GAMMA sub 0 = 27 +- 12 MeV/c exp 2 . (ERA citation 07:044971)

DE82750155 PC **A04**/MF **A01**
Hamburg Univ. (Germany, F.R.). Fachbereich Physik.
Measurement of Radiative Decay of the Resonances J/psi and psi' in Tensor Mesons.
Diss. (D.Sc.),
W. Fues. 25 May 81, 67p MPI-PAE/Exp.El.-92
In German.
U.S. Sales Only.

At decays of the vector mesons J/psi(3100) and psi'(3685) into the final states gamma pi exp + pi exp - and gamma K exp + K exp - radiative decays into the isoscalar tensor mesons f(1270) and f'(15) were looked for: J/psi implies gamma f implies gamma pi exp + pi exp - , J/psi implies gamma f' implies gamma K exp + K exp - , psi' implies gamma f implies gamma pi exp + pi exp - , psi' implies gamma f' implies gamma K exp + K exp - . The measurements were performed using the double arm spectrometer DASP at the e exp + e exp - storage ring DORIS at DESY in Hamburg. The decay J/psi implies gamma g could be observed, the measured branching ratio is GAMMA (J/psi implies gamma f)/ gamma (J/psi implies all) = (1.18 +- 0.28) x 10 exp -3 . For the other decays upper limits for the branching ratios are derived. The results are consistent with a description in the framework of quantum chromodynamics, where these radiative decays result by annihilation at the charmed quark and its antiquark into two gluons and a real photon, and the gluon system goes over into a tensor meson. In the studied mass spectra at the meson pairs from the radiative decays of J/psi and psi' no indication for a gluon bound state could be found. For the process psi' implies gamma 'etasub(c)(2980)' implies gamma pi exp + pi exp - or gamma K exp + K exp - an upper limit for the branching ratio is indicated. (ERA citation 07:044973)

DE82750156 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Production of Charged Hyperpions in E exp + E exp - Annihilation.
R. Y. Zhu, A. Ali, and H. B. Newman. Nov 80, 16p , DESY-80-110
U.S. Sales Only. Available in microfiche only.

We study the production of charged hyperpions - the pseudo goldstone bosons of the hypercolor scenario - in e exp + e exp - annihaltion. Rate estimates and decay distributions based on various decay mechanisms are presented and compared with the background from the usual e exp + e exp - annihilation processes. (ERA citation 07:044986)

DE82750157 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Higher Order Perturbative QCD Calculation of Jet Cross Sections in E exp + E exp - Annihilation.
K. Fabricius, I. Schmitt, G. Kramer, and G. Schierholz. Jun 81, 26p DESY-81/035
U.S. Sales Only. Available in microfiche only.

We present in detail the analytic calculation of the Sterman-Weinberg type 3-jet cross section to order alpha sub(s) exp 2 . The fit to recent PLUTO data gives in the MS scheme alpha sub(s) = 0.17 which corresponds to lambda = 0.24 GeV in the 1-loop approximation. (ERA citation 07:044991)

DE82750159 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Physics Interest in Polarized E exp + E exp - -Reactions at PETRA/PEP Energies.
J. K. Bienlein. Dec 80, 8p DESY-80-126, CONF-800994-22
International symposium on H.E. physics with polarized beams and polarized targets, Lausanne, Switzerland, 25 Sep 1980.
U.S. Sales Only. Available in microfiche only.

After the observation of vertical polarization at PETRA some considerations on its implementation in high-energy physics experiments are given. Vertical beam polarization does not give new information, but the information is obtained easier. Longitudinally polarized beams allow the measurement of electroweak (vector-axialvector) interferences. In the standard model the longitudinal polarization asymmetry is zero for sin exp 2 sub(W) = 0.25 for e exp + e exp - implies mu exp + mu exp - , but is + 17% for e exp + e exp - implies hadrons at 40 GeV c.m. energy. To measure this as a 5 standard deviation effect one needs 4 500 events, i.e. about half-a-year running time. Non-standard models show only small deviations up to 40 GeV, as they are constrained to reproduce the low-energy phenomenology. But significant differences appear at 90 GeV. In QCD the 3-gluon vertex can be observed by the beam-event asymmetry using longitudinally polarized beams. But the effects are small. (ERA citation 07:044988)

DE82750161 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).

Radiative Quark Mass Generation and a Fourth Quark Family.
G. Kramer, and I. Montvay. Jun 81, 7p DESY-81/027
U.S. Sales Only. Available in microfiche only.

We study the possibility to calculate masses and mixing angles of the known three quark families from radiative corrections connecting them to a heavy fourth family. In a left-right symmetric electroweak model with chiral horizontal gauge interactions, we obtain for the heavy quark masses values in the TeV range. (ERA citation 07:044990)

DE82750163 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Baryon Production in QCD Jets.
G. Schierholz, and M. Teper. Jul 81, 12p DESY-81-041
U.S. Sales Only. Available in microfiche only.

Recent data from several sources - UPSILON decays, high energy deep inelastic scattering, e exp + e exp - annihilation at PETRA - reveal substantial baryon production in QCD jets. We discuss the likely mechanisms within the context of QCD, and formulate experimental tests to distinguish amongst them. (ERA citation 07:044993)

DE82750165 PC **A02**/MF **A01**
Max-Planck-Inst. fuer Physik und Astrophysik, Munich (Germany, F.R.).
Diffraction Through Partial Identity.
W. Blum. Jun 81, 10p MPI-PAE/Exp.El.-90
U.S. Sales Only.

A model of diffraction dissociation is proposed in which the quantum-mechanical interference between the incoming and the outgoing wave determines the cross-section. This interference occurs due to the finite lifetime of the excited state. (ERA citation 07:045025)

DE82750166 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Is the E(1420) in J/PSI Decay a Gluonic Bound State.
K. Ishikawa. Nov 80, 8p DESY-80-113
U.S. Sales Only. Available in microfiche only.

Interpretations of the E meson (1420) in the radiative decay of the J/PSI are discussed. The spin-parity, and the two photon decay rate of the E meson will be able to decide whether it is an ordinary quark-antiquark or gluonic bound state. (ERA citation 07:044987)

DE82750168 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Implications of Dynamical Symmetry Breaking for High Energy Experiments.
A. Ali. Jun 81, 39p DESY-81-032
U.S. Sales Only. Available in microfiche only.

A scenario of dynamical symmetry breaking as an alternative to the canonical Higgs mechanism with elementary spin-O fields is described, and its implications for high energy experiments contrasted with those of the canonical theory. The potential role of e exp + e exp - annihilation physics in unravelling the nature of spontaneous symmetry breaking is emphasized. (ERA citation 07:045047)

DE82750169 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Difficulties for a Simple Picture of Spontaneous CP Violation.
D. McKay, and J. G. Koerner. Jun 81, 12p DESY-81/034
U.S. Sales Only. Available in microfiche only.

We show that vertical stroke epsilon'/epsilon vertical stroke is unacceptably large in SU(2)sub(L) x U(1) models with spontaneous CP violation and natural flavor conservation in neutral Higgs-particle interactions if it is assumed that charmed quark intermediate states contribute significantly and that Msub(W) exp 2 >> Msub(H) exp 2 >> Msub(C) exp 2 . From the quark operator structure of box and penguin graphs involving Higgs-particle exchange, we demonstrate that pseudoscalar current matrix elements cannot be enhanced over axial-current matrix elements as has been previously assumed in similar calculations. Alternate ways to evaluate the matrix elements are employed. (ERA citation 07:045048)

DE82750170 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Superweak CP-Violation and Right-Handed Horizontal Interactions.
A. S. Joshipura, and I. Montvay. Jul 81, 14p DESY-81-040
U.S. Sales Only.

A horizontal extension of the Weinberg-Salam electroweak theory by a right-handed 0(3)sub(R)sub(H) gauge symmetry for the three fermion families is studied. By an appropriate choice of the Higgs-scalar fields the CP-symmetry of the Lagrangean is spontaneously broken, but the mixing of the left-handed fermion states, and hence the Kobayashi-Maskawa mixing matrix, remains real. The CP-violation is manifested in the superweak horizontal gauge interactions, which are suppressed by the large mass of the corresponding gauge bosons. It is, however, possible that the horizontal boson acting on the second and third families can be considerably lighter than the other two, implying an interesting phenomenology of the related CP-violation effects and flavour-changing neutral currents. (ERA citation 07:045049)

DE82750171 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Complete S-Matrix of the O(2N) Gross-Neveu Model.
M. Karowski, and H. J. Thun. Nov 80, 24p DESY-80-105
U.S. Sales Only. Available in microfiche only.

We present the complete S-matrix of the O(2N) Gross-Neveu model including kinks, elementary fermions, and higher bound states. In addition to the S-matrix factorization, unitarity, and crossing conditions we make essential use of constraints which follow from the fact that particles in the spectrum are bound states of each other. A consistent solution can only be obtained if the kinks obey generalized statistics. Remarkably, some quantities related to this such as 'spins' and Klein factors show Bott periodicity. (ERA citation 07:045060)

DE82750172 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Lattice Gauge Theories, Confinement, Strings and All That.
G. Muenster. Nov 80, 9p DESY-80-112
U.S. Sales Only. Available in microfiche only.

In this talk I would like to give an overview over some developments in lattice gauge theory, which might be of some interest for experimental physicists. In particular, I shall try to convince you that lattice gauge theory is not only a play-ground for theorists, but is able to produce numerical results for some non-perturbative quantities. And, of course, I would like to tell you about some work, which has been done here in Hamburg. (ERA citation 07:045061)

DE82750173 MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Susskind Fermions on a Euclidean Lattice.
H. J. Thun, P. Weisz, and H. S. Sharatchandra. May 81, 25p DESY-81-022
U.S. Sales Only. Available in microfiche only.

A version of Euclidean lattice QCD obtained by introducing the fermions using Susskind method is described and certain properties discussed. A U(1) axial current having the correct axial anomaly in the continuum limit is identified. We find lambda (Min)/ lambda (L,SUSS.) = 28.78 for SU(3) with 4 flavors. (ERA citation 07:045063)

DE82750174 PC **A02**/MF **A01**
Deutsches Elektronen-Synchrotron, Hamburg (Germany, F.R.).
Light Composite Fermions and Anomaly Matching Revisited.
B. Schrempp, F. Schrempp, and C. H. Albright. Jul 81, 8p DESY-81-038
U.S. Sales Only.

A physically unique and simple solution of 't Hooft's anomaly matching equations in composite models of the type SU(3)sub(M)C x SU(N)sub(L) x SU(N)sub(R) is found for N = 6, if an additional selection criterion for composite 'ground states' is introduced. (ERA citation 07:045064)

DE82750273 MF **A01**
Bonn Univ. (Germany, F.R.). Physikalisches Inst.
Decomposition of Extended Superfields into Irreducible Representations of Supersymmetry.
E. Sokatchev, and V. Rittenberger. May 81, 34p BONN-HE-81-5
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

We give the decomposition of superfields with arbitrary Lorentz and U(N) indices, in terms of irreducible representations of N extended (including U(N) supersymmetry. The spectra of the superspin and super-U(N) Casimir operators as well as one missing label operator are given in closed form. (ERA citation 07:045045)

DE82780496 MF **A01**
Gesellschaft fuer Schwerionenforschung m.b.H., Darmstadt (Germany, F.R.).
Proceedings of the Workshop on Future Relativistic Heavy Ion Experiments.
R. Bock, and R. Stock. May 81, 564p GSI-81-6, CONF-8010154-
Workshop on Future Relativistic Heavy Ion Experiments, Darmstadt, F.R. Germany, 7 Oct 1980.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The papers presented were entered in the data base separately. (ERA citation 07:048559)

DE82902989 MF **A01**
Istituto Nazionale di Fisica Nucleare, Trieste (Italy).
Nucleon-Nucleon Diffraction.
G. Alberi. 30 Jan 81, 35p INFN/AE-81/1
Portions of document are illegible.
Microfiche copies only. U.S. Sales Only.

In this paper we discuss the physical importance of nucleon-nucleon diffraction and the main differences with well understood nucleon nucleus difraction. In the theoretical description of nucleon-nucleon diffraction in terms of the eikonal model, the hypothesis of factorization is shown to be in contradiction with the energy dependence of the impact parameter profile in proton-proton scattering at CERN-ISR. This dependence is highly non-uniform in impact parameter, giving rise to a pronounced peripheral increase with energy of the inelastic overlap function. Two experimental findings in inelastic diffraction indicate the existence of a deep relation of this process with the peripheral increase of the profile function. The first refers to the clear-cut proof that inelastic diffraction is peripheral in impact parameter space, in coherent production on deuteron. The second is the analysis of the integrated cross sections for inelastic diffraction, which leads to the conclusion that most of the total cross section increase in the ISR energy range comes from this process. It is then clear that the eikonal model should be modified in order to include inelastic diffraction. A recent trial in this direction by Miettinen and Thomas shows the existence of a substantial difference between the matter and the charge distribution inside the proton. Their result favors a description of the proton in terms of the string model. (ERA citation 07:044962)

DE82902994 MF **A01**
Istituto Nazionale di Fisica Nucleare, Frascati (Italy). Lab. Nazionale di Frascati.
Forward Absolute Cross Section of the Reaction exp 2 H(D,N) exp 3 He from E/sub D/ = 3 to 6 MeV.
G. Galeazzi, P. Pavan, D. Toniolo, G. Zago, and R. Zannoni. 15 Jan 81, 7p INFN/BE-81/2
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

The zero degree differential cross section of the reaction exp 2 H(d,n) exp 3 He was measured, by means of a proton recoil neutron counter telescope, with an accuracy of 2%, in the incident deuteron energy interval from 3 to 6 MeV. Results are presented. (ERA citation 07:045109)

DE82903108 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Trisaia (Italy). Dipartimento Ciclo del Combustibile.

AMPX II 123- and 219-Group Neutron-Cross-Section Libraries Production and Validation for Criticality Safety Studies.
F. Siciliano, and T. Abbas. Oct 80, 46p CNEN-RT/ING-(80)20
Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

The P sub 3 123 and 219 neutron group cross-section libraries in AMPX II Master Interface Format have been generated from ENDF/B-IV data employing AMPX II system modules. These libraries were tested by using them for calculating various critical experiments which involved different geometries, materials and isotopic compositions of fissile with KENO IV Monte Carlo code and XSDRNPM one dimensional discrete ordinate code. The validation studies indicate that reliable criticality calculations can be made by employing these libraries. The procedures used for producing these libraries and the description of validation criticality calculations are detailed. (ERA citation 07:044330)

DE82903166 PC **A02**/MF **A01**
CEA Centre d'Etudes de Bruyeres-le-Chatel, Montrouge (France). Service de Physique Nucleaire.
Self-Consistent Microscopic Description of Fission: The Scission Mechanism.
J. F. Berger, M. Girod, and D. Gogny. 1981, 12p CONF-8110165-2
International symosium on nuclear fusion and related collective phenomena, Bad Honnef, F.R. Germany, 26 Oct 1981.
U.S. Sales Only.

A microscopic description based on the Hartree-Fock-Bogolyubov approach with various types of constraining fields is used to extract the characteristic features of the collective dynamics of the fission phenomenon at low energy. The two-body force employed is the density-dependent finite range interaction D1 which is particularly suitable for describing the average field together with the pairing field in nuclei. Results are presented for the exp 240 Pu nucleus. The potential energy surface obtained when varying the total elongation of the system, mass-asymmetry and axial asymmetry is presented. Its general behavior is in fair agreement with the data known from experiments. The results of a careful study of the scission of the nucleus are also analyzed. They show in particular that scission occurs via a collective mode completely different from the elongation one, that corresponds to excitation of hexadecapole type. Important consequences concerning the mechanism of the scission process follow from this fact. It explains in particular how the fragments can emerge from fission with a variety of excitation energies ranging from very small values (cold fission events) to much larger ones (hot fission events).

DE82903179 MF **A01**
Centre National de la Recherche Scientifique, Marseille (France). Centre de Physique Theorique.
Future Drell-Yan Pairs Experiments as a Crucial Test for High-Energy Models.
P. Chiappetta, and J. Soffer. Dec 81, 11p CNRS-CPT-81/P.1338
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

It is shown that future experiments for Drell-Yan pairs produced in pN, pi N and p antip collisions will discriminate in a definite way between perturbative QCD and the Massive Quark Model. (ERA citation 07:044978)

DE82903208 MF **A01**
European Organization for Nuclear Research, Geneva (Switzerland).
Measurement of the Fragmentation of the Hadronic System in Different Flavour and Colour States.
B. Pietrzyk. Jul 81, 9p CERN-EP-81-82, CONF-8106183-3
12. international conference of multiparticle dynamics, Notre Dame, IN, USA, 22 Jun 1981, Portions of document are illegible.
Available in microfiche only.

The lepton-pair trigger was used to select the hadronic system in different flavour and colour states; properties of its transformation into hadrons were measured in terms of charge flow, multiplicity distribution, and fragmentation function. (ERA citation 07:048410)

DE82903216 MF **A01**
Institute of Nuclear Energy Research, Lung-Tan (Taiwan).
KINMAT: A Nuclear-Reaction-Kinematics Program.
V. K. C. Cheng. Oct 80, 18p INER-0339
Portions of document are illegible.
Microfiche copies only.

The nuclear reaction kinematics program KINMAT is described in detail. This program determines from the reaction formula the particle masses and the Q-value needed in the kinematics calculation. Energy loss for scattered particles passing through absorbing foils can also be calculated. This program is intended to be run on the ORTEC 6260 computer-based data acquisition and analysis system, providing necessary kinematic information for experimental nuclear physicists during experiments. (ERA citation 07:048560)

DE82903325 MF **A01**
Simon Fraser Univ., Burnaby (British Columbia).
Light Fragment Formation at Intermediate Energies.
D. H. Boal. Mar 82, 15p TRI-PP-82-7, CONF-820238-3
Relativistic heavy-ion winter school, Banff, Canada, 22 Feb 1982, Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Measurements of the inclusive differential cross section d exp 2 sigma/dEd omega for a wide variety of projectile-ejectile-target combinations have usually yielded a similar looking spectrum at fixed ejectile angle when plotted logarithmically. At low ejectile energy, the spectrum is well described by the evaporation model, in which the ejectile evaporates from a nuclear source in which the nucleons are in thermal equilibrium with a temperature of a few MeV. At high ejectile energy, near the kinematic limit, the spectra show transitions to specific nuclear states. In between these extremes is a long tail, in which the differential cross section falls roughly exponentially with ejectile energy. Some years back, it was tempting to describe all of the projectile-ejectile combinations by a single reaction mechanism, largely because of the similarity of the logarithmic plots. It is fairly easy to generate a model with an exponential in it, and many such models were proposed to explain these high energy tails. However, as significantly more data have recently become available, not only have some of the mechanisms been ruled out for all reactions, but also it has become clear that reactions involving one type of projectile may be dominated by one mechanism, while a different projectile involves a very different mechanism. Only by comparison of the target dependence, ejectile mass number dependence, etc., of many different experiments can these conclusions be reached. Thus, while no individual experiment stands out as conclusive in this field of study, taken together they point towards a solution. Hence, the approach taken in this brief summary is to compare various experiments to learn about the mechanism, and then indicate what can be learned by an analysis of the data within a given model. (ERA citation 07:048603)

DE82903336 MF **A01**
Warsaw Univ. (Poland).
Annual Report 1980.
J. Toke. 1980, 85p NP-2903336
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Progress is reported in the following areas: transfer reactions, proton radiative capture, nuclear structure, and instrumentation and methods. (ERA citation 07:048530)

DE82903383 MF **A01**
Jyvaeskylae Univ. (Finland). Dept. of Physics.
Cross Sections of exp 232 Th(P,XN+YP) Reactions at E/sub p/ = 6.8 to 20.2 MeV.
A. Celler, M. Luontama, J. Kantele, and J. Zylicz. Aug 81, 18p JYFL-RR-10/81
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

Cross sections for the (p,n), (p,2n), (p,3n) and (p,pn) + (p,d) reactions on exp 232 Th targets were measured, by comparison with the K-shell ionization cross section, for proton energies between 6.8 and 20.2 MeV. The results are compared with the predictions of the statistical and the pre-equilibrium model. For the (p,pn) reaction, the clean knock-out model is also considered. (ERA citation 07:045164)

DE82903428 MF **A01**
Lund Univ. (Sweden).
Subatomic Physics in Lund. Annual Report 1980.
Jan 81, 205p NP-2903428
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Research in the Division of Cosmic and Subatomic Physics in: (1) nuclear structure physics, (2) high energy and particle physics, and (3) cosmic ray physics is reported. The Division of Elementary Particle Physics performs experimental particle physics and is mainly involved in projects at CERN in Geneva and DESY in Hamburg. The investigations are concentrated on quark and lepton physics. Progress is described. The Division of Mathematical Physics consists of two groups studying theoretical nuclear physics: (1) high spin states, fission and nuclear deformations, and (2) nuclear reactions. A third group is studying problems of classical physics: - thermodynamics and energy research projects. The Division of Nuclear Physics is engaged in research on nuclear structure and applied nuclear physics. The Division of Theoretical High Energy Physics studies theoretical high energy physics with special interest in multiparticle production within the quark-parton model framework. Current activities are reported. (ERA citation 07:048404)

DE82903634 MF **A01**
Kyoto Univ. (Japan). Dept. of Physics.
OBEP-Approach to pi exp 0 -Condensation in Neutron Medium Based on the (ALS) Model Including Isobar delta (1232): Effects of Heavy Mesons and the Stability.
T. Kunihiro, and T. Tatsumi. 1981, 24p KUNS-559
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

The pi exp 0 -condensed state in neutron medium is investigated, based on the Alternating-Layer-Sp (ALS) model by the use of OBEP, and by taking into account the effects of short range-correlation (s.r.c.) and isobar delta (1232 MeV). It is found that critical density n/sub c/ and stability of the system are strongly affected by the coupling properties of baryons to heavy mesons, in particular to rho-meson: for moderate values of the rho-baryon coupling constant we obtain a stabilized pi exp 0 -condensed state at the densities higher than n/sub c/ approx. = 2n sub 0 . It is also found that the range of the s.r.c. affects n/sub c/ but not so much the stability. (ERA citation 07:048611)

DE82903636 MF **A01**
Kyoto Univ. (Japan). Dept. of Physics.
Semiclassical Treatment of Transition Phenomena by Coherent-State Path Integral: A Nontrivial Schematic Model.
Y. Mizobuchi. 1981, 7p KUNS-572
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

A semiclassical method with path integrals in the SU(2) coherent state representation is applied to the investigation of transition phenomena in a schematic model which represents interplay between pairing and quadrupole modes. Numerical evaluation of the semiclassical quantization condition is performed and the result is compared with the exact calculation. (ERA citation 07:048613)

DE82903639 MF **A01**
Kyoto Univ. (Japan). Dept. of Physics.
Dynamical Macroscopic Description of Isoscalar Giant Multipole States in Terms of the Displacement Potential.
K. Ando, and S. Nishizaki. 1981, 22p KUNS-613
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

In the framework of the time-dependent Hartree-Fock theory, an equation of motion for the displacement potential describing isoscalar giant multipole states is derived and solved in an analytic form under the symplifying assumption of the square-well density-distribution. Resulting eigen-modes with multipolarity L greater than or equal to 1 are shown to be mixtures of the Tassie mode and two kinds of longitudinal elastic waves with real and imaginary wave numbers, respectively, the last one being of slight importance for the

lowest mode. For purely radial monopole vibrations, the present description leads to the result essentially equivalent to the earlier one given by Holzwarth, Eckart et al. and also by Serr et al. We derive boundary conditions at the surface which determine the mixing ratios as well as the eigen-frequency. Properties of eigen-modes are discussed and compared with those resulting from a self-consistent RPA calculation for L = 0 and 2. It is indicated that the present description well reproduces basic features of isoscalar giant monopole and quadrupole states given by RPA. (ERA citation 07:048614)

DE82903657 MF **A01**
Kyoto Univ. (Japan). Research Inst. for Fundamental Physics.
Canonical Quantization of the Electromagnetic Field with Dirac's Monopoles.
K. Hirata. Apr 81, 12p RIFP-437
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

From a Lagrangian theory of charge-monopole electrodynamics which uses strings but is free from Dirac's veto, a Hamiltonian theory is derived which describes interaction between electric and magnetic point particles and photons. Dirac's charge quantization condition is also derived. (ERA citation 07:045074)

N82-30033/6 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.
Low Energy, Left-Right Symmetry Restoration in SO(N) GUTS.
R. Holman. May 82, 19p NASA-TM-83940, NAS 1.15:83940
Submitted for Publication.

A general n step symmetry breaking pattern of SO(4K+2) down to SU sub C (3)xSU sub L (2)xU sub Y (1), which uses regular subgroups only, does not allow low energy left right symmetry restoration. In these theories, the smallest mass scale at which such restoration is possible is approximately one billion GeV as in the SO(10) case. The unification mass in SO(4K+2) GUTS must be at least as large as that in SU(5). These results assumed standard values of the Weinberg angle and strong coupling constant.

N82-30034/4 PC **A14**/MF **A01**
Nationaal Inst. voor Kernfysica en Hoge-Energiefysica, Amsterdam (Netherlands).
Low Energy Pion and Muon Physics Fysica Met Large Energie Pionen en Muonen.
J. Konijn. 1981, 320p NIKHEF-82/1
Text in Dutch.

No abstract available.

N82-30044/3 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Calculation of the Neutron Strength Functions of Odd Spherical Nuclei within the Quasiparticle-Phonon Model.
V. V. Voronov, and C. Z. Khuong. 1980, 5p JINR-E-4-13005

The s- and p-wave neutron strength functions of odd spherical nuclei were calculated in the framework of the quasiparticle-phonon model. Isoscalar and isovector components of residual forces are taken into account simultaneously. In contrast to the ordinary strength function calculations by the optical model, strength functions are expressed via the single quasiparticle wave function components being fragmented over many nuclear levels due to the residual interaction. A good agreement with experimental data is obtained. With a uniform set of Hamiltonian parameters the minimum and maximum of neutron strength functions are described simultaneously.

N82-30058/3 PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Low Angular-Momentum-Cutoff in Statistical Heavy Ion Processes.
A. S. Detoledo, and M. S. Hussein. Nov 80, 16p DE82-700197, IFUSP-244

Effects arising from the existence of lower-l cutoff (l sub(min) in Heavy-Ion fusion processes are discussed within the framework of the statistical theory. Both the fluctuaton cross-section as well as the angular cross-correlation function are seen to be qualitatively affected by l sub(min).

N82-30059/1 PC **A02**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Contribution of Quasi-Elastic Processes to the Total Reaction Cross-Section of Heavy Ions.
J. C. Acquadro, M. S. Hussein, D. Pereira, and O. Sala. Dec 80, 7p DE82-700200, IFUSP-P-249

A simple estimate of the ratio of the total quasi-elastic cross-section to the total reaction cross section of heavy ions made and compared to the experimentally deduced for the (16)O+(27)Al system. The slow energy dependence of the ratio is stressed.

N82-30066/6 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.
Phenomenological Optical Potential Analysis of Proton-Carbon Elastic Scattering at 200 Mev.
H. B. Bidasaria, and L. W. Townsend. Jun 82, 21p NASA-TM-84498

Differential cross sections for 200 MeV protons elastically scattered from C-12 were analyzed utilizing a local, complex, spin-dependent optical potential with a harmonic well radial dependence. Analyses were performed using the WKB and eikonal approximations. For the latter, first-order corrections to he phase shifts were incorporated to account for the spin-orbit contribution. Large disagreement between theory and experiment was observed when the usual Thomas form for the spin-orbit potential was utilized. Substantial improvement was obtained by allowing the parameters in the central and spin-orbit potential terms to vary independently.

N82-30078/1 PC **A03**/MF **A01**
Tokyo Univ. (Japan). Inst. for Nuclear Study.
Phenomenological Optical Potentials of Heavy Ions.
S. Kubono. Jan 81, 28p DE82-700218, INS-398
Presented at the Workshop on Phenomenological Interactions of Heavy Ions, Osaka, 30 Oct. - 1 Nov. 1980.

Heavy ion interactions through elastic scattering, inelastic scattering and transfer reactions were studied. The large cross sections at far back angles observed in elastic scattering of even-even nuclei are explained by optical potentials which are transparent at the strong absorption radius region. The mass number dependence of the constant cross section regions which appear in the 1800 excitation functions are explained by a surface transparent potential set with slight energy dependence. However, the structure seen at 900 and 1800 can be simultaneously explained only by a parity dependent potential. The channel coupling effects of a strong inelastic scattering is included approximately by modifying the imaginary term. However, when strong Coulomb excitation dominates the inelastic scattering, the optical potential needs to have a new term of long range absorption. Heavy ion spin orbit term was studied through transfer reactions and inelastic scatterings, giving the order of V sub(so) - 0.7 - 3 MeV for the (13)C, (15)N and (19)F potentials.

PB82-261660 Not available NTIS
National Bureau of Standards, Washington, DC.
Relations between Fermion Masses from Effective Potentials in Internal Space.
Final rept.,
R. C. Casella. Feb 82, 9p
Pub. in Il Nuovo Cimento 67 A, n4 p289-297, 21 Feb 82.

The assumption of approximately similar effective potentials in internal space acting on 1 scale particles' leads to relations among the quark and lepton masses and their weak-interaction mixing angles. The mass of the t-quark is predicted to be 27 GeV. The model also implies that the (nu sub mu, nu sub e) and (s, d) mixing angles are of comparable magnitude, siding against the high-mass solutions for neutrino oscillation accelerator experiments involving nu sub mu yields nu sub e.

PB82-264060 Not available NTIS
National Bureau of Standards, Washington, DC.
Absolute Measurement of the Uranium-235 Fission Cross Section from 0.2 to 1.2 MeV.
Final rept.,
Oren A. Wasson, Michael M. Meier, and Kenneth C. Duvall. 1982, 17p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Nuclear Science and Engineering 81, p196-212 1982.

The absolute (235)U neutron-induced fission cross section has been measured at the U.S. National Bureau of Standards (NBS) 3-MV Van de Graaff Laboratory from 0.2- to 1.2-MeV neutron energy. The mass of the (235)U contained in a large volume multiplated fission ionization chamber was measured relative to the NBS fissionable isotope mass standards. Pulsed beam time-of-flight techniques were used with neutrons from the 7Li(p,n)7Be reaction while the neutron flux was monitored with a large plastic scintillator whose efficiency was both calculated and measured with the associated-particle technique. The cross sections, which were measured with a typical uncertainty of 2.3% are about 2% lower than the ENDF/B-V evaluation.

20I. Plasma Physics

AD-A118 520/6 PC **A02**/MF **A01**
Naval Research Lab., Washington, DC.
High Power Microwave Energy Coupling to Nitrogen during Breakdown.
Memorandum rept.,
W. M. Bollen, C. L. Yee, A. W. Ali, M. J. Nagurney, and M. E. Read. 10 Aug 82, 25p Rept no. NRL-MR-4865

Microwave energy coupling to nitrogen for breakdown conditions have been investigated. The experiments were performed in 25 Torr nitrogen using a 35k GHz 1 microseconds microwave pulse focused to 33 kW/squared cm. The plasma created during breakdown was observed to travel towards the source with a velocity of 4.6 x 10 to the 6th power cm/s. Spectroscopic measurements using a nitrogen helium mixture indicate the average electron density over a 2 cm chord to be 4.4 x 10 to the 12th power/cc and the electron temperature to be 3.8 eV.

AD-A118 557/8 PC **A06**/MF **A01**
Tennessee Univ., Knoxville. Plasma Science Lab.
Interim Scientific Report on Contract AFOSR-81-0093 for the Period March 15, to June 30, 1982,
J. Reece Roth. 20 Jul 82, 104p PSL-82-2, AFOSR-TR-82-0635
Grant AFOSR-81-0093

This interim report summarizes accomplishments supported by AFOSR Contract No. 81-0093 during the period March 15, 1981 to June 30, 1982. During this initial phase of the contract, an electric field dominated plasma facility was designed, assembled, and put into operation. It consists of a steady state Penning discharge operating in a water-cooled magnet system which is capable of up to 0.4 Tesla. The high voltage power supply, magnet system, cooling water, and vacuum system have been assembled, and the first plasma was achieved. Diagnostic systems which have been put into operation thus far include spectrum analyzers to examine RF emissions to 28 GHz and a retarding potential energy analyzer. The plasma has operated for hours at a time, has exhibited a broad-band RF white-noise spectrum over frequencies from 0.5 MHz to 1.0 GHz; has produced ions with characteristic energies along the field lines of several hundred electron volts; and has exhibited evidence of strong parallel electric fields in the plasma. This plasma promises to be a rich source of information and data on physical processes in electric field dominated plasmas. (Author)

AD-A118 588/3 PC **A03**/MF **A01**
Toronto Univ., Downsview (Ontario). Inst. for Aerospace Studies.
Aerophysical Aspects of Gas and Plasma Flows.
Final technical rept. 1 Apr 77-31 Jan 82,
I. I. Glass. 31 Mar 82, 27p AFOSR-TR-82-0639
Grant AFOSR-77-3303

Experimental and analytical investigations have been made of pseudo-stationary oblique shock wave reflections in monatomic, diatomic, triatomic and polyatomic gases. A method using explosive-driven implosions

has been shown to provide a simple means of studying fusion plasmas at extreme temperatures and pressures. Analyses have been made of the dynamics of dusty gas flows produced by shock waves. Extensions of the random choice method have allowed accurate analysis of several types of flows with strong shock waves. (Author)

DE82014385 PC **A03**/MF **A01**
Columbia Univ., New York. Plasma Physics Lab.
Multi-Point Thomson Scattering. Report No. 86.
F. M. Levinton, and G. A. Navratil. 1982, 34p DOE/ET/53016-77
Contract AS02-76ET53016
Microfiche only after original copies are exhausted.

A new detector system for single shot measurement of electron temperature and density profiles in a magnetically confined plasma has been developed. Preliminary results have been obtained with this multi-point Thomson scattering diagnostic on Torus II, a high beta tokamak. It has a density range of 2 x 10 exp 13 cm exp -3 less than or equal to n/sub e/ less than or equal to 5 x 10 exp 14 cm exp -3 in the preionization phase and density of 5 x 10 exp 14 cm exp -3 less than or equal to n/sub e/ less than or equal to 2 x 10 exp 15 cm exp -3 in the tokamak phase. Electron temperatures range from T/sub e/ $>$ 6 eV in the preionization phase to T/sub e/ approx. 100 eV in the tokamak phase. The detector used is a multi-anode microchannel plate (MCP) with a 25 mm diameter multi-alkali photocathode. A 10 x 10 array of anodes collect the current, which has been amplified by as much as 10 exp 6 . Each anode is independent so the MCP can be viewed as a parallel array of 100 independent photomultiplier tubes. (ERA citation 07:045254)

DE82014405 PC **A02**/MF **A01**
Science Applications, Inc., Boulder, CO. Plasma Research Inst.
Effects of Ion-Bounce Resonances on Ballooning-Interchange Modes.
M. N. Rosenbluth, P. J. Catto, and X. S. Lee. Apr 82, 25p SAI-254-82-114-LJ, PRI-41
Contract AC03-76ET53057

In an axisymmetric device, an ion distribution function sharply peaked in pitch angle may be employed to obtain ballooning-interchange stability by optimizing the time these sloshing ions spend in regions of good curvature. However, the resulting magnetohydrodynamically stable modes can be driven unstable by the sloshing ion bounce motion resonating with the background wave. The stability conditions and growth rate for these sloshing ion bounce resonant modes are investigated and an example presented.

DE82701411 MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Possibility of Application of Pulse CO sub 2 Lasers for Plasma Diagnostics by the Scattering Method in Tokamaks.
V. G. Zhukovskii. 1980, 53p IAE-3351/7
In Russian.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Possibility for using CO sub 2 pulsed lasers to measure basic plasma parameters by the scattering method in the tokamak is discussed. Side by side with the measurements of electron temperature and concentration, measurement of scattered radiation at small angles permits to determine ion temperature and effective plasma charge. Application of CO sub 2 pulsed-periodical lasers permits to perform the multipulse operating regime and thus to investigate the time behaviour of plasma parameters under investigation. It is shown that it is possible for tokamaks to perform scattering diagnostics using CO sub 2 pulsed lasers of 5-10 J energy and existing photosensitive elements of the IR range. The CO sub 2 laser application makes it possible to determine electron density and temperature from relative measurements of the "electron" scattering spectra at the angle of approximately 10 exp 0 . (Atomindex citation 13:660489)

DE82701412 MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Plasma Dynamics in Micropinch.
V. V. Vikhrev, V. V. Ivanov, and K. N. Koshelev. 1980, 16p IAE-3359/6
In Russian.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Plasma dynamics in micropinch at 50-150 kA currents is modelled. It is shown that production of plasma points in micropinches can be attributed to Z-pinch discharge compression due to plasma run-out and energy losses for radiation. Specific feature of the discharge is the presence of two compressions. High values of electron temperature (approximately 2 keV) and density (approximately 10 exp 23 cm exp -3) during the second compression result in deep ionization of plasma ions. The compression region is a powerful source of soft X-rays. (Atomindex citation 13:660490)

DE82701413 MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Moscow. Inst. Atomnoi Energii.
Theoretical Study on the Energy Spectra and Electron Transitions in Fe 18-Fe 26 Ions.
G. V. Merkelis, Z. B. Rudzikas, S. D. Shadzhyuvene, V. A. Abramov, and V. S. Lisitsa. 1980, 52p IAE-3366/6
In Russian.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The theoretical method is described and the results of numerical calculations of energy terms, wavelengths and oscillator forces of epsilon1-, M11 and epsilon2-transitions in ions Fe 18-Fe 26, presenting interest for high-temperature plasma diagnostics are given. Calculations are performed in one-configurational Hartree-Fock-Pauli approximation on the basis of a complex of atomated programs worked out at the Institute of physics of the Academy of science of Lith. SSR. A detailed comparison is made of the results for different configurations with other authors data which makes possible to judge about the accuracy of the used calculation method. The accuracy of total values of oscillator strengths and transition probabilities is higher than the corresponding values for separate transitions which is explained by compensation of errors. In those cases when correlation effects for E1 transitions do not play important part the calculated wavelengths and transition probabilities can be used for identification of multicharged ion spectra. (Atomindex citation 13:660491)

DE82701415 MF **A01**
International Centre for Theoretical Physics, Trieste (Italy).
Structure and Thermodynamics of Two-Component Classical Plasmas in the Mean Spherical Approximation.
G. Senatore, M. Rovere, M. Parrinello, and M. P. Tosi. Oct 79, 15p IC-79/145
U.S. Sales Only. Available in microfiche only.

The analytic approximation applied by Gillan to a classical one-component plasma, in which short-range correlations are grafted onto a Debye-Hueckel theory through a hard-sphere boundary condition on the pair correlation function, is examined in a two-component plasma over wide ranges of temperature, densities, and valences. The results for the thermodynamics and the structure of these systems are in good agreement with available Monte Carlo data and generally very close to those yielded by the hypernetted-chain approximation. (Atomindex citation 13:660493)

DE82750180 PC **A02**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Power Deposition Profiles During Lower Hybrid Heating of Tokamak Plasmas.
M. Brambilla. May 81, 24p IPP-4/200
U.S. Sales Only.

A ray-tracing numerical code has been adapted to evaluate the power deposition profiles during Lower Hybrid heating of Tokamak plasmas. In the first part of this report we briefly introduce the physical model of LH heating which is used, and the equations solved by the code. We then describe the approximations which allow a rapid evaluation of the absorption by ions and by electrons as a function of radius, from the results of the ray-tracing subroutine. These profiles are ready for use as heat sources in a radial transport-code simulating the Tokamak discharge. Finally, we present a set of examples relevant for the LH heating experiment planned on the ASDEX Tokamak. (ERA citation 07:045277)

DE82750181 PC **A04**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Generation of Intensive Lyman alpha (121.6 NM) Radiation by Nonlinear Optical Processes.
H. Langer. Jan 81, 61p IPP-1/185
In German.
U.S. Sales Only.

In the present study the generation of intensive Lyman alpha (121.6 nm) radiation by nonlinear optical processes was investigated. The result obtained is, that by frequency tripling in high-pressure Kr/Ar mixtures with an input power of 3 MW a Lyman alpha power of 420 W or 2.6 x 10 exp 12 photons in a 10 ns pulse can be produced. This corresponds to a conversion of 1.4 x 10 exp -4 . With 2-photon-resonant frequency tripling in beryllium vapor a conversion of 3 x 10 exp -4 is achieved already in a non-optimized arrangement. According to the numerical optimization of this system conversion factors of more than 10 exp -3 should be possible with the dye laser used here in an improved configuration. Then several kW of narrow-band and tunable Lyman alpha radiation, which is required for neutral particle diagnostics in fusion plasmas, would be available. (ERA citation 07:045270)

DE82750182 PC **A05**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
CURRIN - A Mathematical Model of the Electricity Increase Phase of a Tokamak-Plasma.
P. Hoess. Dec 80, 88p IPP-4/194
In German.
U.S. Sales Only.

The zero-dimensional time-dependent mathematical model CURRIN for the current initiation phase in a large tokamak is presented. It describes the ionization of the neutral gas in terms of coupled mass and energy conservation equations for five components - H exp 02 , H exp +2 , H exp 01 , H exp +1 and electrons. For studying impurity effects nine equations for O exp 01 to O exp 81 have been added. These equations are coupled to an equivalent external OH circuit to simulate the tokamak start-up phase. All rate coefficients for hydrogen and oxygen needed for the above equation are compiled. The system of equations is prepared for numerical integration by normalization. Its numerical solution forms the basis of the computer model CURRIN. The particle and energy balances of the system are continuously checked and monitored during the solution. Finally, some sample calculations are presented which refer to the current initiation phase in the ASDEX divertor tokamak. Special regard is devoted to the computer time needed for the various options of CURRIN. (ERA citation 07:045275)

DE82750279 MF **A01**
Stuttgart Univ. (Germany, F.R.). Inst. fuer Plasmaforschung.
Connection Between Neutron Production and Instabilities in the Plasma Focus.
B. Rueckle. Jan 81, 99p IPF-81-1
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The cause for neutron and X-ray emission is linked with m = O instabilities in the late discharge phases. The neutron emission begins when an m = O instability is pinched off to a maximum and reaches its maximum during a subsequent re-expansion of the plasma column. A large neutron production is measured under the following conditions: when a fast growing m = O instability is formed directly after maximum compression which leads to the total rupture of the macroscopic pinch structure, when the first m = O pinch in the viscinity of the electrodes occurs, for a small number of m = O pinches (1 or 2). Occasionally the bridging of m = O pinches by outer pharma torches is observed. Discharges with reversed poling of electrodes are considerably slower and produce drastically low neutron yields. Only the odd m = O instabilities are observed here in the high pressure region and are also linked with neutron emission. The comparison with simultaneously performed neutron collimation measurements on the same device, shows that the neutrons close to the inner electrode are produced in slow-decaying relatively dense plasma structures (nsub(e) approx. equal to 2 x 10 exp 24 m exp -3). Detailed considerations on

the neutron production allow the greatest probability for a beam target mechanism. The acceleration of fast deuterons is expected in a zone of raised plasma resistance. The time course of the plasma resistance can be indirectly assessed from the measurements. It shows abnormally high values during the re-expansion after m = O instabilities. X-ray and neutron emissions are simultaneously maximum. Microinstabilities are discussed as cause of the abnormal resistance. (ERA citation 07:045268)

DE82750304 MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Analysis of Radiating Plasma Boundary Layers.
L. L. Lengyel. Sep 81, 32p IPP-1/191
U.S. Sales Only. Available in microfiche only.

The equilibrium and stability properties of radiating plasma boundary layers are checked by means of simple analytical and numerical models with some degree of sophistication regarding the radiative characteristics of the atomic species present in the plasma. The objective of these estimates is information on such properties of radiating layers as their thickness, location, temperature, etc., on the magnitude of the energy fluxes that can be removed from the plasma by means of impurity radiation at tolerable impurity levels, and on the stability of such layers. The main body of this analysis was completed in cooperation with W.S. Goedheer of FOM-Institut, Jutphaas, in the spring of 1980. (ERA citation 07:045273)

DE82750305 MF **A01**
Max-Planck-Inst. fuer Quantenoptik, Garching (Germany, F.R.).
Resonance Absorption in a Self-Consistent Streaming Plasma.
H. Takabe, and P. Mulser. Jul 81, 43p MPQ-49
U.S. Sales Only. Available in microfiche only.

The plasma wave and the self-consistent density profiles are studied theoretically for resonance absorption of p-polarized laser light. The background plasma is assumed to flow in the stationary state in a plane geometry, the flow velocity varying from subsonic to supersonic near the critical density, and the Capacitor model is used. The enhanced plasma wave amplitude with its electron quivering velocity larger than the electron thermal velocity is induced for the driver strength Vsub(d)/Vsub(th) $>$ 0.1. At the same time, in this regime the energy flux converted into the plasma wave is found to exceed the free-streaming limit of the electron heat flux. It is also found that hydrodynamic wave-breaking begins to play an essential role at Vsub(d)/Vsub(th) approx. equal to 0.7. (ERA citation 07:045289)

DE82750306 PC **A02**/MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Tearing Mode Stability in 1D and 2D.
W. Kerner, and H. Tasso. Aug 81, 15p IPP-1/190, IPP-6/207
U.S. Sales Only.

A stability code for tearing modes in 1D and 2D straight equilibria in the tokamak scaling has been developed. It finds the lowest eigenvalues of a Hermitian problem which is obtained analytically by a reduction of the full problem. The main advantage is the powerful handling of equilibria with several resonant surfaces and displaying poloidal and radial mode couplings. The code has been successfully tested by comparing it with explicitly known analytical results for external kinks. (ERA citation 07:045272)

DE82780575 MF **A01**
Max-Planck-Inst. fuer Plasmaphysik, Garching (Germany, F.R.).
Annual Report for 1980 of the Max-Planck-Institut fuer Plasmaphysik.
1980, 182p INIS-mf-6929
In German.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The scientific departments of IPP Garching give a review of their R + D activities in 1980. Other subjects discussed are the work of the central technical services, the organisational structure, the managing directors, administration, general services, and public relations. Publications and conference reports are listed, and projects carried out by the Universities of Stuttgart, Munich, and Frankfurt/Main on behalf of IPP are described. (Atomindex citation 13:660494)

N82-30080/7 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Simple Method of Sheet Plasma Production for High Current Negative Ion I.
J. Uramoto. Apr 82, 31p IPPJ-574

By arranging two rectangular permanent magnets on both sides of a cylindrical plasma along a magnetic field, two types of sheet plasma with thickness of about an ion cyclotron diameter can be produced. The one is called 'noshi-mochi' (flattened rice cake) plasma, whose width is determined by the vacuum chamber diameter. The other is called 'kishimen' (flattened noodle) plasma, whose width is determined by the aperture diameter of discharge anode.

N82-30081/5 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
NBT-1M Design Report.
M. Fujiwara, H. Tsuchidate, and T. Kamimura. Apr 82, 30p IPPJ-579

Results obtained in NBT-1 and EBT-1/S devices are used in the design of the NBT-1M being constructed to obtain experimental scaling laws of plasma confinement and hot electron annulus in a regime that is denser and has a higher temperature. Topics covered include characteristics of BT magnetic fields, wedge coil configurations, machine design parameters of NBT-1M, efficient use of microwave power, and numerical results of magnetic field and particle orbits in the NBT-1M.

N82-30082/3 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Experiment on Heating with Simultaneous Injection of Neutral-Beam and Lower Hybrid Waves in the JIPP T-II Torus.
N. Noda, O. Kaneko, K. Ohkubo, R. Sugihara, and K. Kawahata. Apr 82, 25p IPPJ-567

A hydrogen beam of 16 kV, 4 A was co-injected into hydrogen plasmas and coupled to an rf of 800 MHz, up to 150 kW. It was observed with the measurement of parallel charge exchange neutrals that the fast ions above 16 keV are enhanced by the interaction with the lower hybrid waves. The enhancement is critically reduced when the line averaged electron density is higher than 1.6 x 10 to the 13th power cm(-3) both in the toroidal fields of 22 kG and 16 kG. For the 22 kG case, the cause f the reduction may be related to the location of the turning point of the incident waves; that is, the turning point, in higher densities, locates outside the region where the fast ions produced by neutral beam injection are relatively abundant. For the 16 kG case, however, this interpretation is valid only when a part of the incident wave energy is transferred into waves of shorter wavelengths. The ion temperature increment in the simultaneous heating agrees with the sum of those in the individual heatings even when the beam-rf interaction is considerably strong.

N82-30085/6 PC **A03**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
LOMEGA: A Low Frequency, Field Implicit Method for Plasma Simulation.
D. C. Barnes, and T. Kamimura. Apr 82, 37p IPPJ-570

Field implicit methods for low frequency plasma simulation by the LOMEGA (Low OMEGA) codes are described. These implicit field methods may be combined with particle pushing algorithms using either Lorentz force or guiding center force models to study two-dimensional, magnetized, electrostatic plasmas. Numerical results for omega sub e delta t1 are described.

N82-30086/4 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Time Dependent Drift Hamiltonian.
A. H. Boozer. Apr 82, 15p IPPJ-571

A simple guiding center Hamiltonian H is proposed which obeys all the necessary conditions for asymptotic validity. It agrees to lowest order in gyroradius to system size with Alfven's drift velocity in both time varying and time independent fields. In axisymmetry, a canonical momentum is conserved. The Hamiltonian and the canonical variables are given in magnetic coordinates, which not only give simpler equations but also measure the drift motion of the particles relative to the plasma structure.

N82-30087/2 PC **A02**/MF **A01**
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Linked Tandem Mirror Configuration as a Possible Steady State High beta Plasma Container.
K. Ikuta. Apr 82, 17p IPPJ-572

The possibility of achieving steady state high beta plasma confinement in toroidal geometry is considered in detail by closing off the ends of tandem mirrors entirely by flux bridges, where beta is the ratio of plasma pressure to the magnetic pressure. The key problem of this approach seems to be the magnetic design of magnetohydrodynamically stabilized, preferentially leaky bridges.

N82-30088/0 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Relativisitc Generalization of Strong Plasma Turbulence.
A. C. L. Chian. Feb 82, 7p INPE-2322-PRE/078
Proposed for Presentation at the First Latin-AM. Workshop on Plasma Phys.

Solitons may play an important role in the evolution of strong plasma turbulence. The properties of ion acoustic and Langmuir solitons are examined by taking into consideration the effect of relativistic mass variations. It is shown that relatiistic ion acoustic solitons may exist, whereas simple relativistic Langmuir solitons cannot exist in an infinite plasma. Envelope relativistic Langmuir solitons may be obtained when modulation interactions take place.

PB82-875428 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Plasma Guns. 1972-September, 1982 (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1972-Sep 82.
Sep 82, 120p
Supersedes PB81-857575.Prepared in cooperation with the National Aeronautics and Space Administration, Washington, DC.

This bibliography contains citations concerning the structure of the electron beam of a magnetically insulated coaxial plasma gun, barium rail gun for plasma injection, acceleration of solid pellets using a plasma gun, controlled experiments with rocket-borne plasma guns, and analysis of self-pulsing operation of a plasma gun by circuit theory. Spraying of powders using plasma guns and the gun aspects of rotating plasmas are also included. (This updated bibliography contains 117 citations, 25 of which are new entries to the previous edition.)

20J. Quantum Theory

DE82750277 PC **A02**/MF **A01**
Bonn Univ. (Germany, F.R.). Physikalisches Inst.
Two-Cluster Channel Decoupling of the AGS N-Body Equations.
H. Haberzettl. Aug 81, 10p BONN-HE-81-14
U.S. Sales Only.

As an extension of a four-body investigation by Haberzettl and Sandhas, a partial decoupling of the N-body equations by Alt, Grassberger, and Sandhas (AGS) is performed in such a way that only transitions into a given type of two-cluster configurations remain coupled. Taking into account particle identity, one then has to solve only a single-channel integral equation. All other reaction channels are obtained by quadratures. The resulting expressions resemble optical potential models. Various theoretical and practical aspects of the final set of equations are discussed. (ERA citation 07:045225)

DE82750278 PC **A02**/MF **A01**
Bonn Univ. (Germany, F.R.). Physikalisches Inst.

Spin-Polarized Quantum Systems. Internal Energies Through a Lower Bound Formula and the Quantum Theorem of Corresponding States.
T. K. Lim. Sep 81, 15p BONN-HE-81-21
U.S. Sales Only.

An extension of de Boer's quantum theorem of corresponding states, applicable beyond the usual thermodynamic properties, is realizable when Hall-Post-Stenschke lower-bound energies are matched with the experimental internal energies of the condensed phase of spin-polarized quantum systems and rare-gas atoms. Through it is found evidence that both forms of spin-polarized deuterium have bound ground states, that spin-polarized helium has an internal energy of -2.1 exp 0 K per atom and that the minimum number of atoms required in a cluster so that it behaves like the bulk system ranges from 6 to 19. (ERA citation 07:045226)

DE82903181 MF **A01**
Centre National de la Recherche Scientifique, Marseille (France). Centre de Physique Theorique.
Geometrical Remarks in Statistical Mechanics. I. The Duality Transformation on a Lattice with an Abelian Group as Configuration Space.
A. Messager. Dec 80, 24p CNRS-CPT-79/P.1081-Rev.
Portions of document are illegible.
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We show that the duality transformation in statistical mechanics which connects high and low temperature regime is the usual x-operation in differential geometry (a simple example of which is the correspondence between equipotentials and streamlines). We interpret this fact for phase transition problems. (ERA citation 07:045227)

DE82903647 MF **A01**
Kyoto Univ. (Japan). Dept. of Physics.
Classically Quantized Time-Dependent. Mean Field: The Case of a Bose System.
H. Kuratsuji. 1981, 16p KUNS-606
Portions of document are illegible.
U.S. Sales Only. Available in microfiche only.

We investigate a classical quantization of the time-dependent mean field for a Bose system by utilizing the method of the coherent-state path integral. This is applied to the one-dimensional system with the particles interacting through the attractive delta-function potential, for which the nonlinear mean-field equation admits a soliton solution. Through a specific nature of the soliton solution, the classically quantized spectrum reproduces the exact quantum mechanical spectrum in good accuracy. The extension to many-fermion systems is suggested. (ERA citation 07:048669)

20K. Solid Mechanics

AD-A118 551/1 PC **A02**/MF **A01**
Texas A and M Univ., College Station. Dept. of Mathematics.
On the Steady-State Propagation of an Anti-Plane Shear Crack in an Infinite General Linearly Viscoelastic Body.
Technical rept.,
Jay R. Walton. 29 Oct 80, 17p AFOSR-TR-82-0649
Grant AFOSR-77-3290
Pub. in Quarterly of Applied Mathematics, p37-52 Apr 82.

No abstract available.

AD-A118 600/6 PC **A06**/MF **A01**
Massachusetts Univ., Amherst. Dept. of Civil Engineering.
Response of Thick Cylindrical Shells to Transient Internal Loadings.
Final technical rept. 1 Feb 77-31 Dec 81,
Takeshi Han-Ura, and William A. Nash. Aug 82, 105p ARO-14700.2-EG
Grant DAAG29-77-G-0095

The case of wave propagation in a thick-walled elastic cylindrical shell subject to dynamically applied internal pressure is examined for various shell geometries and modes of application of the internal loading. Shells of both infinite as well as semi-infinite length are treated. In both cases the loading is considered to be axisymmetric. The investigation culminates in the determination of dynamic behavior of the thick shell subject to a band of constant intensity pressure moving at constant velocity along the inner surface of the shell. Displacement and strain components at any point in the shell may be evaluated in terms of dimensionless variables from the computer program presented. (Author)

N82-29619/5 PC **A06**/MF **A01**
Georgia Inst. of Tech., Atlanta. Center for the Advancement of Computational Mechanics.
Creep Crack-Growth: A New Path-Independent Integral (T sub C), and Computational Studies.
Ph.D. Thesis Final Report.
R. B. Stonesifer, and S. N. Atluri. Jul 82, 112p
NASA-CR-167897, NAS 1.26:167897
Contract NAG3-38

The development of valid creep fracture criteria is considered. Two path-independent integral parameters which show some degree of promise are the C* and (Delta T)sub c integrals. The mathematical aspects of these parameters are reviewed by deriving generalized vector forms of the parameters using conservation laws which are valid for arbitrary, three dimensional, cracked bodies with crack surface tractions (or applied displacements), body forces, inertial effects, and large deformations. Two principal conclusions are that (Delta T)sub c has an energy rate interpretation whereas C* does not. The development and application of fracture criteria often involves the solution of boundary/initial value problems associated with deformation and stresses. The finite element method is used for this purpose. An efficient, small displacement, infinitesimal strain, displacement based finite element model is specialized to two dimensional plane stress and plane strain and to power law creep constitutive relations. A mesh shifting/remeshing procedure is used for simulating crack growth. The model is implemented with the quartz-point node technique and also with specially developed, conforming, crack-tip singularity elements which provide for the r to the n-(1+n) power strain singularity associated with the HRR crack-tip field. Comparisons are made with a variety of analytical solutions and alternate numerical solutions for a number of problems.

N82-29620/3 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Stresses in Thin Conical Shells Due to Line Loads.
S. A. Tavares, and W. Altman. Mar 81, 24p INPE-2355-PRE/093

The differential equation for a line load uniformly distributed along a parallel circle is stablished from the homogeneous differential equations governing the bending behavior of a conical shell, whose solution is known in a complex form. The solution by means of the Green function is analyzed, and the conditions to be satisfied and the form of the function for any support condition given. The complex Green function constants are calculated and the form modified for obtaining the real and complex parts of the function in adequate form and, following this, for developing the stress and strain expressions. A numerical example comparing the solution obtained with the membrane solution is presented.

PB82-262726 PC **A02**/MF **A01**
Instituut TNO voor Bouwmaterialen en Bouwconstructies, Delft (Netherlands).
Determination of Surface Strains for Objects of Arbitrary Shape in Holographic-Moire Interferometry.
W. J. Beranek, and A. J. A. Bruinsma. 1981, 13p BI-82-9/62.1.5230

Surface strains for objects of arbitrary shape are determined, using holographic-moire, with illumination in collimated light and observation from one point (camera). Contourline maps for the three orthogonal displacement components are used, from which the 'basic strains' are determined as if the object were flat. The shape of the object is determined by contouring holography or shadow-moire. The 'basic slopes' of the object are determined as if observation were from infinity. The photographs of the interference pattern and the shape of the object serve as reference planes. Formulas are derived in which the surface strains of a non rectangular surface element are expressed into the following known quantities of a rectangular reference element: coordinates of the regarded point, basic strains and basic slopes. By means of a Mohr's circle construction the principal strains and directions can be obtained.

20L. Solid-State Physics

AD-A118 467/0 PC **A03**/MF **A01**
Brown Univ., Providence, RI. Dept. of Chemistry.
The Dependence of Magnetic Properties on Structure in the System Fe2Ge(x)Si(1-x)O4.
Technical rept.,
M. Tellefsen, R. Kershaw, K. Dwight, and A. Wold.
20 Aug 82, 28p Rept no. TR-21
Contract N00014-77-C-0387

No abstract available.

AD-A118 536/2 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Electrical Computer and Systems Engineering.
Quenching and Enhancement of the Exciton and Subband-Gap Absorption in GaAs:Cr Using Two-Beam Transverse Acoustoelectric Voltage Spectroscopy,
B. Davari, and P. Das. 3 Dec 81, 5p AFOSR-TR-82-0630
Grant AFOSR-77-3426
Pub. in Applied Physics Letters, v40 n9 p807-809, 1 May 82.

No abstract available.

AD-A118 541/2 PC **A02**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Electrical Computer and Systems Engineering.
A Study of the High Resistivity GaAs Surface and the GaAs/Oxide Interface Using Two-Beam Transverse Acoustoelectric Voltage Spectroscopy,
B. Davari, and P. Das. 14 Aug 81, 7p AFOSR-TR-82-0631
Grant AFOSR-77-3426
Pub. in Jnl. of Applied Physics, v53 n5 p3668-3672 May 82.

No abstract available.

AD-A118 626/1 Not available NTIS
Columbia Radiation Lab. New York.
Phenomenological Model of Grain-Boundary Trapping States in Polycrystalline Silicon Under Optical Illumination,
E. Poon, and W. Hwang. 24 Aug 81, 9p ARO-16431.49-EL
Contracts DAAG29-79-C-0079, DAAG29-82-K-0080
Availability: Pub. in Solid-State Electronics, v25 n8 p699-705 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

AD-A118 777/2 PC **A03**/MF **A01**
Hughes Research Labs., Malibu, CA.
GaAs Surface Passivation for Device Applications.
Interim rept. no. 5, 15 Jun 80-14 Dec 80,
C. L. Anderson, and M. D. Clark. Jul 82, 42p
AFWAL-TR-82-1088
Contract F33615-78-C-1444

This report describes the progress in the fifth six-month period of a program to develop deposited dielectrics for GaAs device applications. Three applications of the dielectrics have been investigated on this program: (1) isolation of control electrodes, (2) passivation of the GaAs surface, and (3) encapsulation of completed circuits. The dielectrics studied have included silicon oxynitride and mixtures of silicon nitride with germanium nitride. During this reporting period the activities performed emphasized a parametric study of plasma-enhanced deposition (PED) of silicon nitride. The overall process involves cleaning of the sample, anodic oxidation of the GaAs surface, stripping of the anodic oxide, an optional final wet-chemical surface preparation step, pre-deposition plasma-enhanced treatment of the walls of the deposition system or 'preburn' (which may involve a concurrent sample surface treatment), optional plasma etching of the sample surface, and deposition of the dielectric. We have analyzed the effects of variations in (1) oxide stripping and final wet-chemical preparation procedures, (2) preburn, (3) plasma etches, and (4) deposition procedures on the electrical properties of the GaAs/silicon nitride

interface. None of the procedures investigated yielded interfaces useful for fabrication of practical GaAs insulated-gate transistors or integrated circuits. In addition, we have performed preliminary studies to determine appropriate parameters for the plasma-enhanced deposition of germanium nitride and mixtures of silicon nitride with germanium nitride. (Author)

AD-A118 842/4 PC **A02**/MF **A01**
Texas Univ. at Arlington. Dept. of Physics.
Magnetic Phase Transitions and Ground State Properties of Magnetic Crystals.
Final rept. 1 Oct 80-31 Mar 82,
John L. Fry, and Nathan E. Brener. 28 Jun 82, 5p
AFOSR-TR-82-0658
Grant AFOSR-76-2981

Further studies were made of transition metal magnets. A comprehensive treatment of chromium was concluded which gave a thorough understanding of ground state properties, including the spin-density-wave magnetism. Other studies included tests of new theoretical expressions for the magnetic susceptibility and new numerical procedures to evaluate the susceptibility including contributions of orbital motion of electrons in an applied field.

AD-A118 845/7 PC **A04**/MF **A01**
Naval Research Lab., Washington, DC.
A Compilation of Electronic Energy Eigenvalues and Densities of States of Si, Ge, GaP, GaAs, ZnS, and ZnSe.
Memorandum rept.,
C. S. Wang, and B. M. Klein. 31 Aug 82, 58p Rept no. NRL-MR-4482

Document presents a tabulation of energy eigenvalues and densities of states for the semiconductors, silicon, germanium, gallium phosphide, gallium arsenide, zinc sulfide, and zinc selenide. These theoretical results follow from self-consistent linear combination of Gaussian orbitals calculations for these materials.

DE82012807 PC **A02**/MF **A01**
Lawrence Livermore National Lab., CA.
Evidence for Metallic Phases of Strong Covalent Materials in Shock Compression Data.
R. Grover, and F. H. Ree. 1981, 7p UCRL-86705, CONF-810827-14
Contract W-7405-ENG-48
AIRAPT conference on high pressure and 19. EHPRG conference, Uppsala, Sweden, 17 Aug 1981.

The question of where strongly covalent materials become metallic under the influence of pressure is both of great theoretical and applied interest. The only presently available experimental method for studying the high pressure destruction of strong covalent bonds in condensed materials is the dynamic shock compression technique. In recent years a significant amount of dynamic compression data has been accumulated on covalent materials whose anomalous characteristics have been only partially or not at all understood. Preliminary calculations are summarized which can explain the compression data of a number of important covalent materials in terms of high coordination metallic phases stable at high temperatures and pressures. The materials studied are the group IV solids C, Si, and Ge, liquid N sub 2 and CO and various solid and liquid hydrocarbons C/sub m/H/sub n/.

DE82013445 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Multiple Scattering Theory of Electrons in Ordered and Disordered Systems.
J. S. Faulkner. 1981, 9p CONF-8104155-1
Contract W-7405-ENG-26
11. annual symposium on electronic structure of metals and alloys, Dresden, F.R. Germany, 6 Apr 1981.

Band theory equations that have the accuracy of first-principles calculations and the speed of simple tight-binding model calculations are derived. Some recent results in the theory of alloys are presented.

DE82013845 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Temperature Dependence of the Positron Diffusion Length in Metallic Glasses as Studied by Variable-Energy-Positrons.
A. Vehanen, K. G. Lynn, P. J. Schultz, A. N. Goland, and C. L. Snead, Jr. 1982, 3p BNL-31140, CONF-820434-7
Contract AC02-76CH00016
International conference on positron annihilation, Arlington, TX, USA, 3 Apr 1982, Portions of document are illegible.

Results are reported on the temperature dependence of the positron diffusion length L/sub +/ in metallic glasses Cu sub 50 Zr sub 50 and Fe sub 82 B sub 12 Si sub 6 utiliizing a variable-energy positron beam. A short diffusion length of the order of 10 A is observed in the as-received state indicating a high positron trapping probability into structural defects. Evidenced by positron thermal detrapping these defects seem to be shallow, as eg. Bernal holes of the dense random packing of hard spheres model. A lower limit for their concentration is estimated to be 0.1-1.0%. Irreversible changes in L/sub +/ occur in the vicinity of the crystallization temperature T/sub c/ associated with a partial removal of the positron trapping sites. However, annelas several hundred degrees above T/sub c/ are required to obtain a level of L/sub +/ approx. 500 A approaching that of a defect-free metal. This is interpreted as evidence that the crystallized samples still have a large concentration of positron traps, possibly dislocations, precipitates or grain boundaries.

DE82014063 MF **A01**
Los Alamos National Lab., NM.
Green's Functions of the Anderson-Lattice Hamiltonian.
B. H. Brandow. 1982, 5p LA-UR-82-970, CONF-820454-1
Contract W-7405-ENG-36
International conference on valence instabilities, Zurich, Switzerland, 13 Apr 1982, Portions of document are illegible.
Available in microfiche only.

Diagrammatic analysis provides an exact general form for the conduction-electron and f-electron Green's functions; both are determined by a single function G. Zubarev-Hubbard equations of motion are then used to obtain a Hubbard III type approximation for this G. The latter analysis incorporates some self-consistency requirements, to enforce consistency with the general diagrammatic result. This new approximation goes beyond CPA by inclusion of resonance broadening type processes, and may possibly provide a well-defined Fermi surface. (ERA citation 07:045212)

DE82750256 MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Grenzflaechenforschung und Vakuumphysik.
Effects of Ion Slowing-down in Thin Films, Investigated by Combined Auger and X-Ray Microanalysis, Using the Example of High-Dose Ion Implantation, Dose Dependence of the Sputtering Yield, and Widening of Boundary Layers.
H. W. Etzkorn. Dec 80, 134p Juel-1698
In German.Thesis.
U.S. Sales Only. Available in microfiche only.

Effects of ion slowing-down in thin films are investigated by means of combined Auger and X-ray microanalysis, using the example of Ar high-dose implantation in Si, the dose dependence of the Si sputtering yield under Ar exp + ion bombardment (0,5 to 5 keV), and the widening of Ge-Si boundary layers for various ion masses, 4(He) to 131 (Xe), and ion energies (0,5 to 5 keV). (ERA citation 07:044165)

DE82750275 MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Festkoerperforschung.
Electron-Phonon Interaction in Chevrel-Phase Compounds.
D. Rainer, H. Wuehl, and F. Pobell. Mar 81, 72p Juel-1710
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

Experiments on the electron-phonon interaction in Chevrel-phase compounds (CPC) and a theoretical discussion of their results are presented. The authors particularly discuss measurements of the isotope effect of the transition temperature in Mo sub 6 Se sub 8 and SnMo sub 6 S sub 8 and tunneling spectroscopy experiments on Cu sub 1 . sub 8 Mo sub 6 S sub 8 and PbMo sub 6 S sub 8 . These investigations have been performed to get information about the strength of the electron-phonon interaction in CPC, and about the question whether there are phonon modes which couple particularly strongly to the electrons in these compounds. (ERA citation 07:045224)

DE82903381 PC **A03**/MF **A01**
Jyvaeskylae Univ. (Finland). Dept. of Physics.
Electronic Properties of Point Defects in Metals.
R. M. Nieminen. Aug 81, 27p JYFL-RR-12/81, CONF-8108127-1
Nordic solid state physics conference, Copenhagen, Denmark, 10 Aug 1981.
U.S. Sales Only.

Recent progress in electronic structure and related properties of point defects in metals is reviewed. Topics discussed include transition metal impurities in a nonmagnetic host, construction of potential energy surfaces from effective-medium theories, trapping of light interstitials, and pair potentials in metals. (ERA citation 07:045217)

DE82903801 MF **A01**
Kernforschungsanlage Juelich G.m.b.H. (Germany, F.R.). Inst. fuer Festkoerperforschung.
Nuclear Magnetic Ordering in PrNi sub 5.
M. Kubota. Nov 80, 116p Juel-1688
Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

The specific heat of the hyperfine enhanced nuclear magnetic system PrNi sub 5 has been measured from 0.2 mK to 100 mK and in magnetic fields up to 6 T. The system was found to order at (0.40 +- 0.02) mK. From the study of the measured thermodynamic quantities in various magnetic fields, we obtain various information, the order at T = 0 K is ferromagnetic, the hyperfine enhancement factor 1 + K = (12.2 +- 0.5), the enhanced nuclear magnetic moment is (0.027 +- 0.004) mu /sub B/ and a nuclear exchange parameter sigma/sub j/K/sub ij//sup N//k/sub B/ = (0.20 +- 0.04) mK. The nature of the interactions which cause the ordering is discussed, together with the magnetic properties of the system deduced from the analysis. (ERA citation 07:044164)

N82-30111/0 PC **A02**/MF **A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Conjecture on the Critical Frontier of the Ferromagnetic Potts Model on Planar Lattices.
C. Tsallis, and A. C. N. Demagalhaes. 1980, 18p DE82-700089, CBPF-NF-029/80

A conjecture is stated for the approximate critical frontiers of the ferromagnetic q-state Potts model on planar lattices. This conjecture is verified, within a satisfactory degree of accuracy, for a variety of anisotropic and/or 'inhomogeneous' planar lattices (as well as for the first and second neighbor square one), and enables the prediction of a considerable number of new results: 20 independent critical points and a few critical lines.

N82-30112/8 PC **A02**/MF **A01**
Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro.
Induced Magnetism Via Conduction Electron Exchange: Application to PrAl2.
L. Palermo, and X. A. Dasilva. Jul 80, 12p DE82-700086, CBPF-A-0021/80

The magnetization, susceptibility and magnetic specific heat of PrAl2 versus temperature are studied within a model where the onset of magnetism is due to mutual magnetization of the rare-earth ions and the conduction electrons, the ionic magnetization process being ban Bleck-like. The crystal field, bandwith and exchange parameters of the model which fit the available experimental data are 2.5 meV, 7000 meV and 341 meV, respectively.

N82-30115/1 PC **A04**/MF **A01**
Sao Paulo Univ. (Brazil). Inst. de Fisica.
Ising Model with Competing Axial Interactions in the Presence of a Field.
C. S. O. Yokoi, S. R. A. Salinas, and M. D. Coutinho-filho. Sep 80, 60p DE82-70094, IFUSP-2-239

A layered Ising model is studied with competing interactions between nearest and next-nearest layers in the presence of a magnetic field. The analysis is carried out in the mean-field approximation with one effective field for each layer. The high temperature region is studied analytically. The low temperature region is studied numerically. T-H phase diagrams are

constructed which exhibit a variety of modulated phases for various values of the ratio of the strength of the competing interactions. Numerical evidence of the devil's staircase behavior is found either as a function of temperature or applied magnetic field.

PAT-APPL-6-398 740 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Multi-Dimensional Quantum Well Device.
Patent Application,
Gerald J. Iafrate, and Thomas A. AuCoin. Filed 16 Jul 82, 15p AD-D009 653/7
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

A superlattice semiconductor device consisting of a plurality of multi-dimensional charge carrier confinement regions of semiconductor material exhibiting relatively high charge carrier mobility and a low band gap which are laterally located in a single planar layer of semiconductor material exhibiting a relatively low charge carrier mobility and high band gap and wherein the confinement regions have sizes and mutual separation substantially equal to or less than the appropriate deBroglie wavelength. The device, in its preferred form, comprises a thin film of semiconductor material selected from group II-VI or III-V compounds or silicon wherein there is formed laterally located cylindrically shaped periodic regions which are adapted to act as quantum well confinement regions for electrons. (Author)

PATENT-4 330 343 Not available NTIS
Department of the Navy, Washington, DC.
Refractory Passivated Ion-Implanted GaAs Ohmic Contacts.
Patent,
Aristos Christou, and John E. Davey. Filed 10 Dec 80, patented 18 May 82, 4p AD-D009 625/5, PAT-APPL-6-214 926
Supersedes PAT-APPL-6-214 926, AD-D008 067.
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

A method of attaining n+ regions with fine planar geometry in the source and drain of GaAs devices utilizing ion implantation which improves ohmic contact with a refractory film. A layer of TiW refractory film is deposited on GaAs. 29 Si ions are implanted in the GaAs through the refractory film so that the peak concentration is no more than approximately 100A below the TiW-GaAs interface. The entire structure is then annealed. A gold overlay is then deposited on the TiW layer to which electrical contacts may be attached and by which the contact resistivity is measured. Typical specific contact resistivity values are in the low 10 to the minus 6th power ohm/cm squared-range. (Author)

PB82-263971 Not available NTIS
National Bureau of Standards, Washington, DC.
Vibronic Spectrum of the U2 Isoelectronic Center in Si:In.
Final rept.,
Robert E. Stahlbush, and Richard A. Forman. 1982, 6p
Pub. in Jnl. of Luminescence 26, p227-232 1982.

The photoluminescence spectrum of Si:In measured at 2 K and 4 K using samples from several suppliers has been found to be preparation sensitive. In particular, intensity variations allow us to distinguish a sharp no-phonon line at 1.118 eV, variously referred to as U2 or P, and its associated vibronic spectrum from the In(NP) lines and their phonon replicas. Whereas the intensity of the latter did not show preparation sensitivity, the former has been observed to change by three orders of magnitude.

PB82-263997 Not available NTIS
National Bureau of Standards, Washington, DC.
Improved Thermometry for Deep-Level Measurements.
Final rept.,
Willie E. Phillips. 1982, 3p
Pub. in Jnl. of Physics E: Scientific Instruments 15, p499-501 1982.

The various semiconductor deep-level measurement techniques are often limited in their precision by thermometry. A temperature-measurement procedure is described which uses a statistical calibration of forward-biased temperature-sensing diodes to achieve a two-sigma precision of + or - mK. Several applications are discussed to illustrate where the improved thermometry can significantly affect the quality of the results.

PB82-264136 Not available NTIS
National Bureau of Standards, Washington, DC.
Neutron Scattering Studies of Ternary Magnetic Superconductors.
Final rept.,
J. W. Lynn. 1981, 7p
Pub. in Proceedings of Conference Ternary Superconductors, Lake Geneva, WI, September 24-26, 1980, p51-57 1981.

The rare-earth (RE) ternary superconductors belonging to the REMo6X8 (X=S,Se) and RERh4B4 classes of materials have provided the first unambiguous realizations in nature of the coexistence of superconductivity and long range magnetic order. The competitive nature of these two cooperative phenomena is illustrated by the ferromagnetic compounds HoMo6S8 and ErRh4B4, which first become superconducting and then order magnetically at lower temperatures. At first the superconductivity is able to prevent ferromagnetic alignment and a compromise long-wavelength oscillatory magnetization is established at intermediate temperatures. At sufficiently low temperatures, however, the superconductivity is destroyed as ferromagnetism sets in. Antiferromagnetic order, on the other hand, is found to be much less detrimental to superconductivity and there are now a rather large number of ternary materials where antiferromagnetism coexists with superconductivity. Inelastic scattering studies have shown that the crystal field splittings of the rare-earth ions in these materials are generally large in comparison with the magnetic energies.

PB82-264151 Not available NTIS
National Bureau of Standards, Washington, DC.
Bulk Magnetization of Dysprosium-Scandium Alloys.
Final rept.,
J. H. Ferrick, J. J. Rhyne, and R. Segnan. Mar 82, 3p
Pub. in Jnl. of Applied Physics 53, n3 p2232-2234 Mar 82.

Bulk magnetization measurements were made on Dy(0.25)Sc(0.75) and Dy(0.75)Sc(0.25) alloys. Results are discussed.

PB82-265646 Not available NTIS
National Bureau of Standards, Washington, DC.
Measurements of the Quantized Hall Steps in Si at the ppm Level.
Final rept.,
R. J. Wagner, C. F. Levine, M. E. Cage, R. F. Dziuba, and B. F. Field. 1982, 8p
Sponsored in part by Naval Research Lab., Washington, DC.
Pub. in Surface Science 113, p10-15 1982.

Hall voltages of n-channel (100) Si MOSFETs have been studied with a high sensitivity potentiometric method. These experiments reveal Hall steps flat to within at least 1 ppm at a temperature of 1.5 K and magnetic field of 13 T. In addition, unanticipated features have been observed near the edges of the Hall steps. Possible explanations for these effects will be discussed.

PB82-265661 Not available NTIS
National Bureau of Standards, Washington, DC.
Critical Current Measurements: A Compendium of Experimental Effects.
Final rept.,
L. F. Goodrich, and F. R. Fickett. May 82, 19p
Pub. in Cryogenics 28, p225-241 May 82.

The results of a program to evaluate the measurement of the critical current of relatively small (less than 600 A) practical superconductors are presented. Experimental data showing the effect of various parameters on the measurement are given. Specific areas covered are: experiment design and sample mounting; electric field and resistivity criteria; temporal and spatial field and current variation; and temperature and strain effects. The goal of the presentation is to describe the critical current measurement process and its pitfalls in sufficient detail to serve as a guide for those relatively new to the field of practical superconductors.

PB82-875733 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nuclear Magnetic Resonance of Solids. 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for 1970-Sep 82.
Sep 82, 220p
Supersedes PB81-858540.

This bibliography contains citations concerning nuclear magnetic resonance spectroscopy as applied to studies of the solid state of matter. Techniques are discussed and specific information on organic solids and semiconductors at low temperatures are considered. (This updated bibliography contains 176 citations, 30 of which are new entries to the previous edition.)

PB82-875741 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Nuclear Magnetic Resonance of Solids. 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for 1976-Sep 82.
Sep 82, 254p
Supersedes PB81-858557.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning nuclear magnetic resonance spectroscopy as applied to studies of the solid state of matter. High resolution, spin resonance, two-dimensional and multiquantum fourier spectroscopy of solids are discussed. The chemical characterization of coal and solid electrolytes are considered. (This updated bibliography contains 258 citations, 83 of which are new entries to the previous edition.)

20M. Thermodynamics

DE82005690 MF **A01**
Sandia National Labs., Albuquerque, NM.
Two-Dimensional Radiation in Absorbing-Emitting-Scattering Media Using the P-N Approximation.
A. C. Ratzel, and J. R. Howell. 1982, 52p SAND-82-0129C, CONF-820604-4
Contract AC04-76DP00789
AIAA/ASME joint conference on fluids, plasma, thermophysics and heat transfer, St Louis, MO, USA, 7 Jun 1982, Portions of document are illegible.
Best available copy from document source. Available in microfiche only.

Radiative energy transfer in a gray absorbing, emitting, and isotropically scattering medium is considered in a two-dimensional rectangular enclosure using the P-N differential approximation. The P-1 and P-3 spherical harmonics approximations for the intensity distribution are used in this study and uniform volumetric generation of energy is included in the energy conservation formulation. The two-dimensional partial differential equations (PDE's) are formulated for the P-N approximations and are combined to yield a single second-order PDE for the P-1 approximation and four coupled second-order PDE's for the P-3 approximation. The P-1 approximation results are obtained from separation of variables solutions. The P-3 results are obtained numerically using successive-over-relaxation methods to solve the finite difference formulations for the four equations and associated boundary conditions. The two approximation results are compared with numerical Hottel zone results and with results from other approximation methods and show that the P-3 approximation can be used for predicting emissive power distributions and heat transfer rates in two-dimensional media with opacities of unity or greater. The P-1 approximation is found to be identical to the diffusion solution and should thus be used only if the medium is optically dense. (ERA citation 07:052268)

DE82903111 MF **A01**
Comitato Nazionale per l'Energia Nucleare, Rome (Italy). Direzione Centrale per il Controllo della Gestione e dei Programmi.
Thermal Transients in a Semi-Infinite Region in Which Flux is Unidirectional.
E. Stampone. Nov 80, 73p CNEN-RT/ING-(80)23
In Italian.Portions of document are illegible.
U.S. Sales Only. Best available copy from document source. Available in microfiche only.

In this report are examined thermal transients, in a semi-infinite region in which the flux is unidirectional, for various initial conditions, with and without heat source, and with three homogeneous boundary conditions. All formulas obtained are suitable for use in a digital computer machine. (ERA citation 07:047678)

PB82-876095 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Stirling Engines. June, 1970-September, 1982 (Citations from the NTIS Data Base).
Rept. for Jun 70-Sep 82.
Sep 82, 323p
Supersedes PB80-851702.

This bibliography contains citations concerning Stirling engine technology. Design, performance testing, development, engine problems, temperature control, computerized simulation, and reliability are considered. Applications of various types of stirling engines to automobiles, the utilization of solar energy, and an artificial heart system are included. (This updated bibliography contains 268 citations, 137 of which are new entries to the previous edition.)

20N. Wave Propagation

AD-A118 492/8 PC **A03**/MF **A01**
Naval Research Lab., Washington, DC.
Initial Results from HF Propagation Studies during Solid Shield.
Memorandum rept.,
D. R. Uffelman, and L. O. Harnish. 30 Jul 82, 40p
Rept no. NRL-MR-4849

In May 1981, NRL personnel manned two (2) receiver sites located at Norfolk Virginia and Fort Bragg, North Carolina to obtain 24 hour a day coverage of data available from an oblique sounder network put into operation to support the DoD Solid Shield exercises. The resulting photographic data were scaled to obtain the maximum useable frequency (MUF) vs time for each circuit recorded. One circuit was selected as a control path to provide an update to a model which predicts the MUF. Upon obtaining an update of this model using the control path, the model to compute MUF's for other paths for which data was available. Under the geomagnetically disturbed conditions which prevailed during Solid Shield, the update provided accuracies of about 1 MHz RMS with a new update required about every 3 hours to maintain this accuracy. These results may have profound implications on the design and ultimate operation of automated frequency management systems. (Author)

AD-A118 790/5 PC **A05**/MF **A01**
Rome Air Development Center, Griffiss AFB, NY.
Effects of Energetic Particle Events on VLF/LF Propagation Parameters/1979,
John P. Turtle, John E. Rasmussen, and Wayne I. Klemetti. Mar 82, 85p Rept no. RADC-TR-82-79
See also AD-A103 945.

This report provides a summary of disturbance effects of energetic particle events on VLF/LF propagation parameters as observed by the USAF High Resolution VLF/LF Ionosounder in Northern Greenland. Disturbance effects on ionospheric reflectivity parameters, including reflection heights and coefficients, are presented along with data from a riometer, a magnetometer, and satellite particle detectors. (Author)

N82-29512/2 PC **A04**/MF **A01**
Ohio State Univ., Columbus. ElectroScience Lab.
Meteorological Factors in Earth-Satellite Propagation.
Annual Report, 12 Mar. 1981 - 31 Mar. 1982.
C. A. Levis, R. C. Taylor, R. Leonard, K. T. Lin, and B. Pigon. Mar 82, 56p NASA-CR-169208, NAS 1.26:169208
Contract JPL-956013
Prepared for JPL.

Using the COMSTAR D/4 28.56 GHz beacon as a source, a differential gain experiment was performed by connecting a 5-meter paraboloidal antenna and a 0.6-meter paraboloidal antenna alternately to the same receiver. Substantial differential gain changes were observed during some, but not all, rain events. A site-diversity experiment was implemented which consists of two 28.56 GHz radiometers separated by 9 km. The look-angle corresponds to that of the D/4 beacon, and data were obtained with one radiometer during several weeks of concurrent beacon operation to verify the system calibration. A theoretical study of the effect of scattering from a nonuniform rain distribution along the path is under way to aid in interpreting the results of this experiment. An improved empirical site diversity-gain model was derived from data in the literature relating to 34 diversity experiments. Work on the experiment control and data acquisition system is continuing with a view toward future experiments.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-A118 576/8 PC **A02**/MF **A01**
California Univ., Berkeley. Dept. of Mechanical Engineering.
Applications of Rayleigh Scattering to Turbulent Flows with Heat Transfer and Combustion.
Final rept. 1 Mar 80-30 Apr 82,
L. Talbot, and F. Robben. 18 May 82, 18p AFOSR-TR-82-0667
Contract F49620-80-C-0065

Rayleigh scattering has been developed as a diagnostic tool and used in conjunction with Laser Doppler velocimetry to study two reacting flows; the interaction of a Karman vortex street with a flame, and the interaction of grid-produced turbulence with a flame. Vortex street interaction is characterized by radical distortion of the flame front. Dilatation effects downstream of the flame front dominate, and vortices are not discernible in this region. Numerical modeling gave qualitative agreement with the experimental results. For the grid-induced turbulence, the measured density and velocity statistics were compared with the predictions of the Bray-Moss-Libby model. It was found that intermediate states had to be taken into account. Two-point density correlation measurements, the first ever reported, showed that the length scales of turbulence within the reaction zone were the same in all three orthogonal directions. Space-time correlation measurements in the flow direction were in accord with the Taylor hypothesis. (Author)

AD-A118 641/0 PC **A04**/MF **A01**
Princeton Univ., NJ. Dept. of Mechanical and Aerospace Engineering.
High Temperature Catalytically Assisted Combustion.
Final rept. 1 Jun 80-31 May 81,
C. Bruno, F. V. Bracco, B. S. H. Royce, and P. M. Curtis. Aug 81, 64p AFOSR-TR-82-0666
Grant AFOSR-76-3052

Measurements of catalytic combustion of lean mixtures of propane/air at atmospheric pressure over platinum/alumina/cordierite catalysts were carried out over a broad range of equivalence ratios and flow velocities. Substrate (honeycomb) temperatures, chemical species at the catalyst were measured. A substantial data base for catalytic oxidation C3H8 over platinum catalysts was obtained. A two-dimensional model of the gas-phase oxidation of propane was developed. When the experimental wall temperature is used as the boundary condition for the gas-phase reactions; emissions predicted from the model agree well with measured values. From comparison with the experimental data, indications are that propane oxidation takes place via a three-step kinetic mechanism. Also from study of the relative importance of gas-phase vs. surface oxidation, conclusions are that most of the propane is burnt in the gas-phase rather than at the catalytic wall and that the wall kinetics is slower than the gas diffusion transplant. (Author)

AD-A118 652/7 Not available NTIS
Northwestern Univ., Evanston, IL. Dept. of Engineering Science and Applied Mathematics.
Steady and Pulsating Modes of Sequential Flame Propagation,
Stephen B. Margolis, and Bernard J. Matkowsky. 1 Jun 81, 22p ARO-16537.7-MA
Contract DAAG29-79-C-0183
Availability: Pub. in Combustion Science and Technology, v27 p193-213 1982 (No copies furnished by DTIC/NTIS).

No abstract available.

DE82014306 PC **A02**/MF **A01**
Spectron Development Labs., Inc., Costa Mesa, CA.
Particulate Processes in Pulverized-Coal Flames. Quarterly Technical Progress Report, November-January 1982.
Jan 82, 22p SDL-82-2177-29Q
Contract AC22-80PC30300

During this reporting period, the fifth quarter, major attention has been focused on the characterization of pulverized coal particles and on the performance testing of both the open burner and the furnace burner. The axial temperature distributions of both burners were mapped. The axial temperature decay varied between 250 and 500 exp 0 K per meter. This is to be compared with the design goal of 200 exp 0 K per meter but is considered satisfactory for our experimental requirements. Holographic investigation of coal decomposition was initiated during this period but was limited to the open burner. However, in order to produce a coherent observation of the decomposition phenomenology, the holographic results are purposely excluded and will be incorporated into a later report pending the completion of holographic experiments with the furnace burner. (ERA citation 07:044320)

DE82014903 PC **A12**/MF **A01**
Argonne National Lab., IL.
Technical Evaluation: Pressurized Fluidized-Bed Combustion Technology.
S. A. Miller, G. J. Vogel, S. M. Gehl, J. E. Hanway, Jr., and R. F. Henry. Apr 82, 256p ANL/FE-81-65
Contract W-31-109-ENG-38
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Microfiche only after original copies are exhausted.

The technology of pressurized fluidized-bed combustion, particularly in its application to a coal-burning combined-cycle plant, is evaluated by examining the technical status of advanced-concept plant components - boiler system (combustor, air-handling and air-injection equipment, and heat exchangers); solids handling, injection, and ejection system; hot-gas cleanup equipment; instrumentation/control system; and the gas turbine - along with materials of plant construction. Environmental performance as well as energy efficiency are examined, and economic considerations are reviewed briefly. The evaluation concludes with a broad survey of the principal related research and development programs in the United States and other countries, a foreview of the most likely technological developments, and a summary of unresolved technical issues and problems.

DE82015504 MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Low NO/sub X/ Heavy Fuel Combustor Conept Program.
G. Beal, B. Hinton, F. Kemp, P. Russel, and R. Sederquist. Oct 81, 90p DOE/NASA/0149-3, NASA-CR-165512, UTC-GTR---3236
Contract AI01-77ET13111
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This report describes a gas turbine technology program to improve and optimize the staged rich-lean low NO/sub x/ combustor concept. Subscale combustor tests were run to develop the design information required to optimize the fuel preparation, rich burn, quick air quench, and lean burn steps of this combustion process. High combustion efficiency, low smoke and NO/sub x/ emissions in the range of 50 ppM were achieved with distillate, residual and high fuel-bound nitrogen coal derived fuel. The program provided the

information required for the design of high pressure full-scale gas turbine combustors capable of providing environmentally clean combustion of minimally processed and synthetic fuels. Liquid fuel atomization and mixing, rich zone stoichiometry, rich zone liner cooling, rich zone residence time, and quench zone stoichiometry were identified as very important considerations in the design and scale-up of the rich-lean combustor.

N82-29376/2 PC **A04**/MF **A01**
Pennsylvania State Univ., University Park. Fuels and Combustion Lab.
Plane Flame Furnace Combustion Tests on JPL Desulfurized Coal.
Final Technical Report.
J. J. Reuther, H. T. Kim, and J. G. H. Lima. 15 May 82, 73p NASA-CR-169199, NAS 1.26:169199
Contract JPL-956123
Prepared for JPL.

The combustion characteristics of three raw bituminous (PSOC-282 and 276) and subbituminous (PSOC-230) coals, the raw coals partially desulfurized (ca -60%) by JPL chlorinolysis, and the chlorinated coals more completely desulfurized (ca -75%) by JPL hydrodesulfurization were determined. The extent to which the combustion characteristics of the untreated coals were altered upon JPL sulfur removal was examined. Combustion conditions typical of utility boilers were simulated in the plane flame furnace. Upon decreasing the parent coal voltaile matter generically by 80% and the sulfur by 75% via the JPL desulfurization process, ignition time was delayed 70 fold, burning velocity was retarded 1.5 fold, and burnout time was prolonged 1.4 fold. Total flame residence time increased 2.3 fold. The JPL desulfurization process appears to show significant promise for producing technologically combustible and clean burning (low SO3) fuels.

N82-29777/1 PC **A13**/MF **A01**
Garrett Turbine Engine Co., Phoenix, AZ.
Computations of Soot and and NO sub X Emissions from Gas Turbine Combustors.
Final Report.
S. K. Srivatsa. May 82, 300p NASA-CR-167930, NAS 1.26:167930
Contract NAS3-22542

An analytical program was conducted to compute the soot and NOx emissions from a combustor and the radiation heat transfer to the combustor walls. The program involved the formulation of an emission and radiation model and the incorporation of this model into the Garrett 3-D Combustor Perfomance Computer Program. Computations were performed for the idle, cruise, and take-off conditions of a JT8D can combustor. The predicted soot and NOx emissions and the radiation heat transfer to the combustor walls agree reasonably well with the limited experimental data available.

PB82-264128 Not available NTIS
National Bureau of Standards, Washington, DC.
Resonantly Enhanced Two Photon Photoionization of NO in a One Atmosphere Flame.
Final rept.,
W. Gary Mallard, J. Houston Miller, and Kermit C. Smyth. 1 Apr 82, 10p
Pub. in Jnl. of Chemical Physics 76, n7 p3483-3492, 1 Apr 82.

The first example of multiphoton ionization in a flame is reported. The resonantly enhanced two photon photoionization spectrum of NO from 270 to 317 nm in an atmospheric pressure H2/air/N2O flame is essentially identical with respect to both line position and intensity to that which would be expected from the one photon absorption to the intermediate A state. A model is developed here which accounts for this result by including large rates for collisional repopulation of the laser depleted state.

PB82-264169
National Bureau of Standards, Washington, DC.
Cigarette Ignition Behavior of Commercial Upholstery Cover Fabrics.
Final rept.,
G. H. Damant, J. F. Krasny, C. J. Morin, and S. S. Williams. Mar 82, 16p
Pub. in Jnl. of Consumer Product Flammability 9, n1 p31-46 Mar 82.

The cigarette ignition of 70 primarily cellulosic upholstery cover fabrics was studied at the California Bureau of Home Furnishings (BHF) and the Center for Fire Research, National Bureau of Standards (NBS). BHF used the mini-mockup procedure, and classified the fabrics according to self-extinguishment or the time to reach 10 or 20 percent weight loss. Each of the fabrics was mounted over a variety of upholstery filling materials. NBS classified the fabrics according to self-extinguishment or ignition when the cigarettes were placed into crevices made up by a cushion and two types of filling materials in the vertical member, or on the flat surface of the cushion. Relatively cigarette ignition resistant fabrics, i.e., those which did not ignite in the NBS mock-ups also generally self-extinguished in the BHF polyester batting and foam mini-mockups. Certain fabric characteristics which tend to improve cigarette ignition resistance could be identified, such as low weight in cellulosic fabrics, blending of thermoplastic fibers with cellulosic fibers, certain backcoatings, and scouring of cellulosic fabrics to remove impurities present in raw cotton.

21C. Electric Propulsion

N82-29355/6 PC **A07**/MF **A01**
Colorado State Univ., Fort Collins. Dept. of Physics.
Plasim: A Computer Code for Simulating Charge Exchange Plasma Propagation.
Final Report.
R. S. Robinson, W. D. Deininger, D. R. Winder, and H. R. Kaufman. Jan 82, 126p NASA-CR-169209, NAS 1.26:169209
Contract JPL-955322
Prepared for JPL.

The propagation of the charge exchange plasma for an electrostatic ion thruster is crucial in determining the interaction of that plasma with the associated spacecraft. A model that describes this plasma and its propagation is described, together with a computer code based on this model. The structure and calling sequence of the code, named PLASIM, is described. An explanation of the program's input and output is included, together with samples of both. The code is written in ANSI Standard FORTRAN.

21D. Fuels

DE82001321 PC **A02**/MF **A01**
Engineering Societies Commission on Energy, Inc., Washington, DC.
ESCOE Engineering Program. Quarterly Report, June 1-September 30, 1981.
Y. Ksander. 1981, 10p DOE/ET/10679-T11, FE-2468-97
Contract AC01-77ET10679

The Executive Manager met with the DOE Technical Representatives from the Bartlesville and Pittsburgh Energy Technology Centers to discuss and formulate technical tasks to be performed by ESCOE. The following tentative tasks were established: technical and economic study of high-pressure coal liquefaction technologies; technology data base for coal liquefaction, coal combustion and coal science; pulverized fuel combustion and synfuel utilization; and third generation coal conversion processes. During this reporting period, the embargo on recruitment of professional staff and program development was lifted, allowing ESCOE to proceed with delivery of technical services and knowledge to the Department of Energy.

DE82012395 MF **A01**
Mathematica, Inc., Princeton, NJ. Mathtech Div.
Advanced Coal-Using Community Systems. Task 1A. Technology Characteristics. Volume 2. Fuel- and Energy-Distribution and End-Use Systems.
R. R. Tison, C. F. Blazek, N. P. Biederman, N. J. Malik, and M. G. Gamze. Mar 79, 385p DOE/CS/20082-T4-V.2
Contract AC05-76CS20082
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This report is presented in 2 volumes. It contains descriptions of engineering characterizations and equipment used in coal processing, fuel and energy distribution, storage, and end-use utilization. Volume 2 contains 4 chapters dealing with: distribution systems for solid fuels, liquid fuels, gaseous fuels, steam, and electric power; storage systems for solid fuels, liquid fuels, gaseous fuels, electricity, and thermal energy; energy management systems; and energy-end use systems. (ERA citation 07:042197)

DE82012879 PC **A02**/MF **A01**
Institute of Gas Technology, Chicago, IL.
Calculation of Calorific Value of Coal/Char from Its Ultimate Analysis.
D. M. Mason, and A. T. Talwalkar. 1982, 17p CONF-820243-1
Contract AC01-76ET10251
Coal testing conference, Lexington, KY, USA, 16 Feb 1982.

A new correlation developed to calculate calorific (heating) value of coal and char from their elemental composition is significantly better than other similar correlations. The correlation was developed by means of regression analysis of a large data bank of US coals. A new correlation was needed because of the more accurate heating value estimation required by engineering calculations around coal conversion reactors. The only previously available correlations did not give satisfactory results when applied to the data bank of US coals. The new correlation resulted in a standard deviation of 129 Btu/lb for all ranks of coal as compared to a range of 139 to 222 Btu/lb for other formulas. The other correlations did not give better results than the new formula, not even on the modified Parr basis that accounts for the pyrite content of coal. Analysis of variances indicated that about 25% of the variance between the observed and calculated values can be accounted for by the variance in the experimental determinations of heating values and elemental composition. The rest may be attributed to the varying maceral and mineral compositions and possibly to a lower level of precision of the determinations of the data bank.

DE82015032 PC **A08**/MF **A01**
Los Alamos National Lab., NM.
Electric-Utility Oil and Gas Use in the Eighties.
C. D. Kolstad, D. S. Abbey, A. J. Martinez, D. S. Williams, and F. A. Wolak, Jr. Apr 82, 164p LA-9319-MS
Contract W-7405-ENG-36
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This report forecasts possible levels of oil and gas use by electric utilities in the US through 1990. The analysis is done at a regional level. High and low levels of electricity demand as well as nominal and diminished availability of new generating capacity are assumed. Projected oil and gas use for 1990 ranges from 1000 to 3200 barrels per day.

DE82015496 PC **A03**/MF **A01**
Sandia National Labs., Albuquerque, NM.
Sandia Tar-Sands Subprogram FY81 Annual Report.
J. R. Wayland, Jr. Mar 82, 44p SAND-81-2496
Contract AC04-76DP00789

During FY81, Sandia National Laboratories assisted the Laramie Energy Technology Center's Tar Sands Program in the areas of reservoir access and alternate extraction concepts. This report covers the work done in the areas of controlled source audio magnetotelluric mapping, radio-frequency heating instrumentation, and joint US/Canadian permeability enhancement.

DE82900709 MF **A01**
Samarbejdsgruppen for Teknologisk Udvikling af Biogas, Glostrup (Denmark).
Biogas in Denmark. Results of a Biogas Plant Operation. Report of 1.12.80 of Registration and Measurement Program of Large-Scale Plants.
S. Kraemer, and M. Parsby. Jan 81, 41p NP-2900709
In Danish.Portions of this report are illegible.
U.S. Sales Only. Available in microfiche only.

Nine biogas producing full-scale and demonstration plants were investigated and results compared in Dec. 1980. None is quite stable in operation, but in average every biogas plant produced about 0.5 m exp 3 biogas daily, or about 0.2 m exp 3 per 1 Kg dry organic matter.

Pig manure was found to be more efficient than cattle manure. (ERA citation 07:042694)

DE82903669 MF **A01**
KVB, Inc., Irvine, CA.
Survey of Electric Utility Gas- and Oil-Fired Boiler Population. Interim Report.
N. R. Parker, D. A. Dale, and M. N. Mansour. Apr 82, 150p EPRI-AP-2342
Portions of document are illegible.
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Large quantities of natural gas and fuel oil are consumed by the US in base-loaded electric generating plants. A major portion of the fuel oil used is imported, making the utilities that are dependent on this fuel especially vulnerable to escalating prices and disruptions in supply. The substitution of these fuels with a domestically available fuel supply derived from coal is therefore considered very desirable in order to ensure the fuel supply and independence from foreign sources of fuel. EPRI is planning several field combustion tests to evaluate the compatibility of synthetic liquid fuels with natural gas and oil-fired utility boilers. To help in the planning of thse tests and setting future synfuel utilization priorities, the present survey is conducted. The survey is directed to identify the size of the utility market for synthetic boiler fuel, the geographic location of this market, and the characteristics of combustion equipment having potential for deployment of these fuels. The survey is based on the National Electric Reliability Council (NERC) summary reports and the Utility Data Institute, Inc. (UDI) data base. The survey shows that the utilities dependence on natural gas and fuel oil is expected to continue for a number of years. The consumption of fuel oil over the next ten years is projected to average 562 million barrels/years; the consumption of natural gas for the same period is estimated at 2360 cf exp 3 (376 million barrels of fuel oil equivalent). The bulk of natural gas and fuel oil is consumed in steam power plants while less than 6% of the fuel consumption is used in simple-cycle combustion turbines and combined-cycle plants. Age data for boilers show that 65% of the oil-fired and 70% of the gas-fired capacities are less than 20 years of age. The data suggest the utilities demand for these fuels must continue unless an alternate fuel is provided, such as a synthetic gaseous or liquid fuel from coal.

DE82903672 MF **A01**
Bechtel Corp., San Francisco, CA.
Plant Monroe Sulfurmeter Evaluation.
J. D. Ruby, T. R. Wood, and D. R. Brown. Apr 82, 160p EPRI-CS-2365
Portions of document are illegible.
Available in microfiche only.

The performance of an apparatus for measuring continuously the sulfur content of coal entering a 3000-MW electric generating power station is described. The apparatus, known as a Sulfurmeter, interrogates a sidestream of coal in a nondestructive fashion using prompt neutron activation analysis (PNAA). Preceding the Sulfurmeter is a coal-handling facility that blends a 1% S coal with a 3% S coal. The Sulfurmeter is used to evaluate the blend, which must meet an emission standard of 3.68 lb of SO sub 2 /10 exp 6 Btu when fired. Sulfur measurements by the PNAA apparatus were compared with those from traditional ASTM chemistry - satisfactory agreement was obtained. (ERA citation 07:042149)

N82-29477/8 PC **A03**/MF **A01**
Finnish Energy Economy Association, Helsinki.
Classification and Properties of Peat for Fuel Purposes.
B. Berggren, A. Kalmari, and P. Leino. 1980, 30p DE82-900924, EKONO-158

The normal peat classification systems used to determine the types of peat and the degree of decomposition are provided. The properties of peat as a fuel are discussed starting from practical production parameters applied in Finnish conditions. Chemical composition, heating values, moisture content, and bulk densities form the basis for fuel use. Boiler and furnace design depends on several factors which are discussed. Basic differences between milled peat, sod peat, peat briquettes and peat pallets, which are the normal commercial forms in which peat can be obtained in Finland, are described.

N82-29479/4 PC **A03**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario).
Gasoline and Other Transportation Fuels from Natural Gas in Canada.
E. A. Symons, and A. I. Miller. Mar 81, 33p DE81-700550, AECL-7258
In English; French Summary.

Ways in which natural gas might displace crude oil as a source of fuels for the Canadian transportation market are reviewed. Three approaches are possible; (1) direct use as compressed natural gas, (2) conversion of natural gas to methanol, and (3) further conversion of methanol to synthetic gasoline.

N82-29491/9 PC **A10**/MF **A01**
Swedish Council for Building Research, Stockholm.
Biofuels for Heating: In Municipal Energy Planning.
R. Hardell, U. Liljequist, R. Schuster, and L. Wester. 1980, 204p DE82-900677, SIB-R-102-1980
Text in Swedish.

A review of systems for harvesting, transporting, storing and firing such biofuels as wood, peat, straw and reed is presented. Cost, availability of the fuels and environmental effects are also treated.

N82-29492/7 PC **A17**/MF **A01**
Studsvik Energiteknik A.B., Nykoeping (Sweden).
Assessment of Potential Future Market in Sweden for Hydrogen as an Energy Carrier.
Final Report.
G. Carleson. Sep 80, 382p DE82-900643, NE/EPA-80/4
Sponsored in Part by the International Energy Agency.

Future hydrogen markets during the period 1980-2025 were projected. The probable range of hydrogen production costs were evaluated as well as the expected market shares in competition with alternative energy carriers. Three different energy scenarios were developed, based on nuclear energy, renewable indigenous energy sources and the present energy picture, respectively. Within each of the three scenarios, an analysis was made of the competitiveness of hydrogen on both the demand and the supply sides of the sectors: chemical industry, steel industry, peak power production, residential and commercial heating, and transportation. Costs were calculated for the production, storage and transmission of hydrogen. Health, enviromental and societal implications were taken into consideration. The results were used to estimate the market penetration of hydrogen.

N82-29768/0 PC **A07**/MF **A01**
Danmarks Tekniske Bibliotek, Lyngby. Fysisk Lab.
Biogas of Manure and Sludge.
F. Kraemer, J. Gundermann, E. Kofoed, and J. Nielsen. Jan 81, 128p DE82-900839, NP-2900839
Text in Danish.

Biogas production from farmyard manures and sewage sludges is based on anaerobic processes (methane-bacteria) and aerobic processes (fermentative bacteria). Biogas product has high calorific value and a number of small, pilot-scale and full-scale municipal systems of biogas production is described inclusive technological solutions and cost-benefit analysis. Experience of electric power generators fueled by biogas is evaluated from the view point of competitiveness with other fuels.

PB82-259375 PC **A08**/MF **A01**
National Bureau of Standards, Washington, DC.
Heating Values of Natural Gas and Its Components.
Technical rept.,
George T. Armstrong, and Thomas L. Jobe, Jr. May 82, 168p NBSIR-82-2401
Sponsored in part by Groupe Internationale des Importateurs de Gaz Natural Liquefie.

The standard enthalpies of combustion of the pure hydrocarbons C1 to C6 at 298.15 K and 101 325 Pa selected from the literature, with reference to a more detailed document, are used to derive heating values for the ideal gas and the real gas on molar, mass, and volumetric bases at five reference conditions involving other temperatures and pressures. Values can be obtained at both dry and water saturated conditions. The second virial coefficients and their first derivatives are used to calculate the effects of non-ideality. Procedures are given and illustrated for calculating the heating values of mixtures from the composition and the data given for the pure compounds. The relationships between the quantities presented in the tables are illustrated by charts. A procedure is given for estimating the uncertainties of the calculated results.

PB82-260886 PC **A03**/MF **A01**
Hoffman-Holt, Inc., Silver Spring, MD.
Unconventional Natural Gas Resources: An Overview Covering the Resources and Environmental Aspects of Production,
Lawrence Hoffman. Aug 82, 49p EPA-600/7-82-053
Contract EPA-68-02-3671

This report covers natural gas from the following unconventional sources: western tight sands, Devonian shale, coal deposits, geopressured aquifers, and landfills. This report covers the resource base, potential production levels, and associated environmental aspects. Over the past 10 years our natural gas reserve level has been declining. At year end 1979 our reserve to production ratio for the entire U.S. was less than 10 years. This has occurred even though exploration for natural gas has been increasing both in terms of number of wells drilled and total footage drilled. There is potential for our natural gas supply to be materially augmented by gas from unconventional resources. In this regard, gas from western tight sands, Devonian shale, and coal seams potentially could provide 1 Tcf of gas in 1985 with significantly greater amounts in 2000. Over the same period, the potential gas from geopressured aquifers and landfills are believed to be considerably less. The environmental concerns vary with source and are minimal for tight sands, Devonian shale, and landfills. Conceivably, significant environmental concerns could be associated with gas recovery from geopressured aquifers.

PB82-265554 PC **A07**/MF **A01**
Missouri Univ.-Rolla. Dept. of Civil Engineering.
Transportation Energy Contingency Plans for Rural Areas and Small Communities.
Final rept. Oct 80-Dec 81,
Charles E. Dare. Dec 81, 150p DOT-I-82-24
Prepared in cooperation with Meramec Regional Planning Commission, Rolla, MO. Sponsored in part by Ozarks Regional Commission.

Following the petroleum supply disruptions of the 1970's the Federal Government took actions to ensure continuation of transportation services during a critical situation. This led to development of state transportation energy contingency plans; however the Missouri Transportation Fuels Emergency Plan, like those of many states, does not contain specific recommendations for small communities and rural areas. This investigation was undertaken to determine the most effective transportation fuel conservation measures which could be implemented by such areas during energy emergencies. Recommendations are presented concerning strategies to reduce gasoline use in rural areas and the institutional arrangements required for coping with a fuel shortage. It is suggested that the multi-county regional planning commission should become the lead agency in implementing and coordinating fuel conservation measures in rural areas. The existing network of emergency preparedness officers should be utilized to inventory local fuel distribution services, monitor local service station operating practices and to serve motorists who might be stranded. The University of Missouri Cooperative Extension Service should offer educational programs covering fuel conserving driving techniques, vehicle maintenance, trip planning, and ridesharing.

PB82-811506 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Coal Transportation. 1964-August, 1982 (Citations from the NTIS Data Base).
Sep 82, 124p
Supersedes PB81-805921 and PB80-806292.

Economic and engineering aspects of coal transportation by truck, rail, water, and pipeline are discussed. Abstracts cover cost comparison of the various transportation modes and factors affecting future expansion of the transportation systems. A few abstracts deal with environmental effects and pretreatment of coal for transportation. (This updated bibliography

contains 124 citations, 36 of which are new entries to the previous edition.)

21E. Jet and Gas Turbine Engines

AD-A118 473/8 PC **A02**/MF **A01**
McDonnell Douglas Research Labs., St. Louis, MO.
Unsteady Transonic Flow in a Two-Dimensional Diffuser.
Final technical rept. 1 Apr 77-31 Mar 82,
Miklos Sajben, Thomas J. Bogar, and Joseph C. Kroutil. 31 Mar 82, 23p MDC-Q0767, AFOSR-TR-82-0622
Contract F49620-77-C-0082

Nominally two-dimensional flows in two convergent-divergent diffuser models were investigated experimentally. The flows contained a normal shock downstream of the throat with pre-shock Mach numbers ranging to 1.4. Self-sustaining fluctuations occurred invariably and were closely investigated. Steady and fluctuating wall and midstream pressures were measured; high-speed schlieren photography was extensively employed. Shock displacement histories were measured with a line-scan camera technique. (Author)

AD-A118 720/2 PC **A05**/MF **A01**
Dayton Univ., OH. Research Inst.
Characteristics of High Performance Ejectors.
Final rept. 30 Jan-30 Nov 81,
John E. Minardi. Jan 82, 94p UDR-TR-82-01, AFWAL-TR-81-3170
Contract F33615-81-K-3017

The use of ejectors in energy conversion processes and thrust augmentation requires that the mixed flow be produced at a high efficiency. Although many definitions of efficiency have been used to describe the efficiency of an ejectors, we have used an efficiency based on thermodynamic availability which is referenced to the stagnation properties of the secondary flow (the flow being 'pumped'). As is well known, a compressible-flow, control-volume approach to analyzing a constant area ejector yields two solutions: one with a subsonic mixed flow and one with a supersonic mixed flow. The supersonic mixed flow produces the best efficiencies and highest total pressures. The properties of the supersonic mixed flow are of necessity related to the properties of the subsonic mixed flow by the normal shock relations. Nonetheless, in practice, the subsonic mixed flow is, in general, not achieved through a normal shock (or pseudo-normal shock) from the supersonic mixed flow solution. A model is presented that gives a physical interpretation to the various solutions obtained from the mathematics, and more importantly, some fundamental limits are presented and a procedure is developed for determining the efficiency that can be achieved in a constant area ejector when the mixed flow is supersonic.

AD-A118 810/1 PC **A04**/MF **A01**
Solar Turbines, Inc., San Diego, CA. Turbomach Div.
Development Report for the 10 KW Sound Attenuation Program (Preproduction 'F' Kit).
Final rept. Jan 77-Dec 81,
Gary L. Butzke. 2 Dec 81, 55p Rept no. ERR-0195
Contract DAAK70-77-C-0032

This final report covers the program undertaken to develop an acoustic enclosure for the 10 KW 60 Hz GTED Generator Set. The enclosure was designed to meet the performance requirements of category F of MIL-STD-1474. Tests were conducted to determine any detrimental effects of running the gas turbine engine inside of a closed environment. Tests were also conducted to determine the acoustical characteristics of the enclosed package and a comparison done with the standard 10 KW 60 Hz generator set to determine the attenuation provided by the acoustic enclosure.

AD-A118 819/2 PC **A03**/MF **A01**
Pennsylvania State Univ., State College. Applied Research Lab.
Efficiency Improved Turboprop.
Technical memo.,
W. S. Gearhart. 10 Jun 82, 29p Rept no. ARL/PSU/TM-82-124
Contract N00024-79-C-6043

Renewed attention has been focused on the efficiency of aircraft propulsion as the cost of fuel has risen. Studies conducted by NASA (1) to obtain fuel efficient aircraft have considered relatively highly-loaded turboprop systems. The disc loadings of these propellers are as much as four times higher than those on present turboprop aircraft. The higher disc loadings result in greater slipstream swirl and higher energy losses. Of primary importance is the radial distribution of the energy losses across the slipstream due to the tangential and axial velocities. This study presents the results of analysis defining the various sources of energy loss resulting from a swirling slipstream downstream of a propeller. Experimental data are presented demonstrating the presence of such losses and a propeller configuration discussed which offers improved propulsive performance when relatively highly-loaded propellers are employed. (Author)

DE82008638 MF **A01**
Pratt and Whitney Aircraft, Middletown, CT. Materials Engineering and Research Lab.
Hot Corrosion of Ceramic-Coating Materials for Industrial/Utility Gas Turbines.
R. H. Barkalow. Jan 81, 33p DOE/ET/13330-T1
Contract AC03-78ET13330
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Furnace hot corrosion tests of yttria-stabilized zirconia (YSZ) and other candidate ceramic coating materials were run under combinations of temperature, salt deposits, and gaseous environments know to cause severe hot corrosion of state-of-the-art metallic coatings for industrial/utility gas turbines. Specimens were free-standing ceramic coupons and ceramic-coated IN 792. X-ray fluorescence and diffraction data on free-standing YSZ coupons showed surface yttrium loss and cubic-to-monoclinic transformation as a result of exposure to liquid salt and SO sub 3 . Greater destabilization was observed at the lower of two test temperatures (704 and 982 exp 0 C), and destabilization increased with increasing SO sub 3 pressure and V-containing salt deposits. The data suggest that hot corrosion of YSZ can occur by a type of acidic dissolution of Y sub 2 O sub 3 from the ZrO sub 2 solid solution. In spite of the greater surface destabilization at 704 exp 0 C, the bond coat and substrate of YSZ-coated IN 792 were not attacked at 704 exp 0 C but severely corroded at 982 exp 0 C. These results show that degradation of ceramic-coated metallic components can be more strongly influenced by the porosity of the microstructure and fluidity of the liquid salt than by the chemical stability of the ceramic coating material in the reactive environment. Other ceramic materials (SiO sub 2 , Si sub 3 N sub 4 , ZrSiO sub 2 , and mullite), concurrently exposed to the same conditions which produced significant destabilization of YSZ, showed no evidence of reaction at 704 exp 0 C but noticeable corrosion at 982 exp 0 C. Also, the high temperature corrosion was greater in air than in SO sub 3 -containing gases. These trends suggest that hot corrosion of the silicon-containing ceramics was basic in nature, and such materials have potential for good resistance to chemical decomposition under the acidic conditions characteristics of industrial/utility gas turbines.

DE82013322 PC **A03**/MF **A01**
General Electric Co., Schenectady, NY. Energy Systems Programs Dept.
Long-Term Materials Test Program: Materials Exposure Test Plan.
Dec 81, 26p DOE/ET/15457-1111
Contract AC21-79ET15457

The Long Term Materials Test Program is designed to identify promising corrosion resistant materials for coal-fired gas turbine applications. Resistance of materials to long term accelerated corrosion will be determined through realistic PFB environmental exposure of candidate turbine materials for up to 14,000 hours. Selected materials also will be evaluated for their ability to withstand the combined erosive and corrosive aspects of the PFB effluent. A pressurized fluidized bed combustor facility has been constructed at the General Electric Coal Utilization Research Laboratory at Malta, New York. The 12-inch diameter combustor will burn high sulfur coal with moderate-to-high chlorine and alkali levels and utilize dolomite as the sulfur sorbent. Hot gas cleanup is achieved using three stages of cyclone separators. Downstream of the cylone separators, a low velocity test section (approx. 30 ft/s) capable of housing 180 pin specimens 1/4" diameter has been installed to assess the corrosion resistance of the various materials at three different temperatures ranging from 1300 to 1600 exp 0 F. Following the low velocity test section is a high velocity test section consisting of four cascades of airfoil shaped specimens, six specimens per cascade. This high velocity test section is being used to evaluate the combined effects of erosion and corrosion on the degradation of gas turbine materials at gas velocities of 800 to 1400 ft/s. This report summarizes the materials selection and materials exposure test plan for the Long Term Materials Test. (ERA citation 07:043232)

DE82013779 PC **A09**/MF **A01**
Exxon Research and Engineering Co., Linden, NJ.
Fundamental Characterization of Alternate-Fuel Effects in Continuous-Combustion Systems. Final Technical Report, 15 August 1977-30 November 1981.
R. M. Kowalik, L. A. Ruth, R. B. Edelman, R. C. Farmer, and E. Wong. Jan 82, 197p DOE/ET/11313-11
Contract AC22-77ET11313
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All work conducted under the DOE-sponsored contract entitled Fundamental Characterization of Alternate Fuel Effects in Continuous Combustion Systems is summarized. Highlights of past experimental work previously reported detailed descriptions of recent experimental work, and a summary discussion of the complete set of experimental results generated during the program are included. The final versions of quasi global chemical kinetics and modular gas turbine combustor models developed during the program are described. The highlights of past experimental work cover the effects of fuel type, equivalence ratio, residence time, temperature, and some liquid spray characteristics on soot production in the Jet-Stirred Combustor (JSC) and the Liquid Fuel Jet-Stirred Combustor (LFJSC). The recent experimental work includes results on the effects of mixing, pressure, and fuel composition on soot production in the Variable Pressure Jet-Stirred Combustor (VPJSC) and the effects of fuel type, equivalence ratio, residence time, and some fuel injection characteristics on fuel nitrogen conversion to NO/sub x/ precursors in the JSC and LFJSC. The description of the quasi global chemical kinetics and modular turbine combustor model includes lists of pertinent reactions and corresponding rate constants, comparison of model calculations with available experimental data, and model predictions.

N82-29265/7 PC **A03**/MF **A01**
Grumman Aerospace Corp., Bethpage, NY.
Simulation of a Hydrocarbon Fueled Scramjet Exhaust.
Final Report.
J. Leng. Jun 82, 32p NASA-CR-3583, NAS 1.26:3583
Contract NAS1-16401

Exhaust nozzle flow fields for a fully integrated, hydrocarbon burning scramjet were calculated for flight conditions of M (undisturbed free stream) = 4 at 6.1 km altitude and M (undisturbed free stream) = 6 at 30.5 km altitude. Equilibrium flow, frozen flow, and finite rate chemistry effects are considered. All flow fields were calculated by method of characteristics. Finite rate chemistry results were evaluated by a one dimensional code (Bittker) using streamtube area distributions extracted from the equilibrium flow field, and compared to very slow artificial rate cases for the same streamtube area distribution. Several candidate substitute gas mixtures, designed to simulate the gas dynamics of the real engine exhaust flow, were examined. Two mixtures are found to give excellent simulations of the specified exhaust flow fields when evaluated by the same method of characteristics computer code.

N82-29311/9 PC **A05**/MF **A01**
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
Establishment of a Rotor Model Basis.
R. E. Mcfarland. Jun 82, 93p NASA-TP-2026, A-8605
Prepared in Cooperation with Army Aviation Research and Development Command, Moffett Field, Calif.

Radial-dimension computations in the RSRA's blade-element model are modified for both the acquisition of extensive baseline data and for real-time simulation use. The baseline data, which are for the evaluation of model changes, use very small increments and are of high quality. The modifications to the real-time simulation model are for accuracy improvement, especially when a minimal number of blade segments is required for real-time synchronization. An accurate technique

for handling tip loss in discrete blade models is developed. The mathematical consistency and convergence properties of summation algorithms for blade forces and moments are examined and generalized integration coefficients are applied to equal-annuli midpoint spacing. Rotor conditions identified as 'constrained' and 'balanced' are used and the propagation of error is analyzed.

N82-29323/4 PC **A10**/MF **A01**
Teledyne CAE, Toledo, OH.
Cooled Variable Nozzle Radial Turbine for Rotor Craft Applications.
C. Rogo. Mar 81, 205p NASA-CR-165397, NAS 1.26:165397
Contracts NAS3-22005, DA PROJ. 1L1-62209-AH-76

An advanced, small 2.27 kb/sec (5 lbs/sec), high temperature, variable area radial turbine was studied for a rotor craft application. Variable capacity cycles including single-shaft and free-turbine engine configurations were analyzed to define an optimum engine design configuration. Parametric optimizations were made on cooled and uncooled rotor configurations. A detailed structural and heat transfer analysis was conducted to provide a 4000-hour life HP turbine with material properties of the 1988 time frame. A pivoted vane and a moveable sidewall geometry were analyzed. Cooling and variable geometry penalties were included in the cycle analysis. A variable geometry free-turbine engine configuration with a design 1477K (2200 F) inlet temperature and a compressor pressure ratio of 16:1 was selected. An uncooled HP radial turbine rotor with a moveable sidewall nozzle showed the highest performance potential for a time weighted duty cycle.

N82-29324/2 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
QCSEE over-the-Wing Engine Acoustic Data.
H. E. Bloomer, and I. J. Loeffler. May 82, 28p NASA-TM-82708, E-990

The over the wing (OTW) Quiet, Clean, Short Haul Experimental Engine (QCSEE) was tested at the NASA Lewis Engine Noise Test Facility. A boilerplate (nonflight weight), high throat Mach number, acoustically treated inlet and a D shaped OTW exhaust nozzle with variable position side doors were used in the tests along with wing and flap segments to simulate an installation on a short haul transport aircraft. All of the acoustic test data from 10 configurations are documented in tabular form. Some selected narrowband and 1/3 octave band plots of sound pressure level are presented.

N82-29717/7 PC **A02**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Techniques for Enhancing Durability and Equivalence Ratio Control in a Rich-Lean, Three-Stage Ground Power Gas Turbine Combustor.
D. F. Schultz. 1982, 14p NASA-TM-82922, DOE/NASA/10350-33-E-1313
Contract DE-AI01-77ET-10350
Presented at 1982 Joint Power Generation Conf., Denver, 17-21 Oct. 1982; Sponsored by Asme.

Rig tests of a can-type combustor were performed to demonstrate two advanced ground power engine combustor concepts: steam cooled rich-burn combustor primary zones for enhanced durability; and variable combustor geometry for three stage combustion equivalence ratio control. Both concepts proved to be highly successful in achieving their desired objectives. The steam cooling reduced peak liner temperatures to less than 800 K. This offers the potential of both long life and reduced use of strategic materials for liner fabrication. Three degrees of variable geometry were successfully implemented to control airflow distribution within the combustor. One was a variable blade angle axial flow air swirler to control primary airflow while the other two consisted of rotating bands to control secondary and tertiary or dilution air flow.

N82-30030/2 PC **A08**/MF **A01**
General Electric Co., Cincinnati, OH. Aircraft Engine Business Group.
Forward Velocity Effects on Fan Noise and the Suppression Characteristics of Advanced Inlets as Measured in the NASA-Ames 40 by 80 Foot Wind Tunnel.
Final Report.
M. T. Moore. May 80, 161p NASA-CR-152328, NAS 1.26:152328
Contract NAS2-8675

Forward velocity effects on the forward radiated fan noise and on the suppression characteristics of three advanced inlets relative to a baseline cylindrical inlet were measured in the NASA Ames Research Center 40 x 80 foot Wind Tunnel. A modified JT15D turbofan engine in a quiet nacelle was the source of fan noise; the advanced inlets were a Conventional Takeoff/Landing (CTOL) hybrid inlet, a Short Takeoff/Landing (STOL) hybrid inlet, and a treated deflector inlet. Also measured were the static to flight effects on the fan noise of canting the baseline inlet 4 deg downward to simulate typical wing mounted turbofan engines. The CTOL hybrid inlet suppressed the high tip speed fan noise as much as 18 PNdB on a 61 m (200 ft) sideline scaled to a CF6 size engine while the STOL hybrid inlet suppressed the low tip speed fan noise as much as 13 PNdB on a 61 m (200 ft) sideline scaled to a OCSEE size engine. The deflector inlet suppressed the high tip speed fan noise as much as 13 PNdB at 61 m (200 ft) overhead scaled to a CF6 size engine. No significant changes in fan noise suppression for the CTOL and STOL hybrid inlets occurred for forward velocity changes above 21 m/s (68 ft/s) or for angle of attack changes up to 15 deg. However, changes in both forward velocity and angle of attack changed the deflector inlet noise unpredictably due to the asymmetry of the inlet flow field into the fan.

PB82-811514 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gas and Steam Turbines, General: Corrosion and Erosion. 1970-April, 1981 (Citations from the Engineering Index Data Base).
Sep 82, 360p

General components of gas/steam turbines exposed to corrosive and erosive environments are analyzed in these reports gathered in a worldwide literature survey. Analysis of cavitation related erosion/corrosion has been excluded from these citations. (This updated bibliography contains 360 citations, none of which are new entries to the previous edition.)

PB82-811522 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Gas and Steam Turbines, General: Corrosion and Erosion. May, 1981-August, 1982 (Citations from the Engineering Index Data Base).
Sep 82, 83p
Supersedes PB81-806283 and PB80-806672.

General components of gas/steam turbines exposed to corrosive and erosive environments are analyzed in these reports gathered in a worldwide literature survey. Analysis of cavitation related erosion/corrosion has been excluded from these citations. (This updated bibliography contains 76 citations, all of which are new entries to the previous edition.)

21G. Reciprocating Engines

PB82-265364 PC **A04**/MF **A01**
Corporate-Tech Planning, Inc., Waltham, MA.
The Assessment of Variable Valve Timing of Internal Combustion Engines for Fuel Economy Improvements and Practicability.
Final rept. Aug 79-Mar 81,
Theordore Taylor, Jr., and Robert L. Kallin. Dec 81, 71p DOT-HS-806-179
Contract DOT-HS-9-02110

This project studied the results of previous research on the potential effects of variable valve timing for improving automotive engine fuel economy. Methods of implementation of valve timing control and their practicality were also assessed. Some of the sources claim fuel economy improvements as high as 18 to 20% but conclusions suffer from insufficient test data as well as a recording of major variables. Other deficiencies include insufficient attention to effects on driveability; lack of standard reference for data comparisons; and little consideration toward manufacturing feasibility. It is concluded that savings of 5 to 10% over the normal drive cycle are probably realizable providing emphasis is directed towards optimizing valve timing schedules at low speeds under low loads as opposed to the current practice of wide open throttle. Methods of implementation as reported from research programs and patent disclosures were also evaluated, categorized and assessed for manufacturing practicability.

PB82-265372 PC **A02**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Standards Development and Support Branch.
Characterization of a Heavy-Duty Diesel Engine Modified for Operation on Neat Methanol.
Technical rept.,
Randy Jones,. Jun 82, 20p EPA-AA-SDSB-82-12

Due to the increased interest in methanol as a motor vehicle fuel, the Environmental Protection Agency Office of Mobile Source Air Pollution Control (OMSAPC) has initiated a vehicle and engine testing program to characterize the emissions and performance of the most likely methanol applications. This report describes the results of testing an International Harvester DT-466B heavy duty diesel engine with modifications.

PB82-875964 PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Wankel Engines. June, 1976-September, 1982 (Citations from the Energy Data Base).
Rept. for Jun 76-Sep 82.
Sep 82, 93p
Supersedes PB80-851751.Prepared in cooperation with the Department of Energy, Washington, DC.

This bibliography contains citations concerning state of the art technology of wankel engines. Engine fuel economy, supercharging effects, air pollution control devices, performance evaluations, design, and operation are discussed relative to the wankel rotary piston engine. Cooling systems, lubricating systems, and applications are included. (This updated bibliography contains 92 citations, 27 of which are new entries to the previous edition.)

21H. Rocket Motors and Engines

AD-A118 848/1 PC **A05**/MF **A01**
Ogden Air Logistics Center, Hill AFB, UT. Propellant Analysis Lab.
LGM-30B, Stage II Dissected Motors Test Report,
Daryl Anderson. Jul 82, 90p Rept no. MANPA-471(82)

This report contains the data obtained from testing propellant and case bond materials from four dissected Minuteman Stage II Motors. The directive specifies the tests required to elucidate any age induced problems which may affect the service life of the Stage II Motor. Linear regression analysis was used to indicates trends of the test parameters. A representative regression plot was made of several parameters with each motor tested to date identified by different symbols. The regression analysis normally verified the trends established during the last test phase. Although there were some trend changes either from or to significant status, it does not seem likely that any problems of major concern are apparent at this time.

N82-29349/9 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Huntsville, AL. George C. Marshall Space Flight Center.
Sts-3 Main Parachute Failure.
R. Runkle, and K. Henson. Jun 82, 28p NASA-TM-82490, NAS 1.15:82490

A failure analysis of the parachute on the Space Transportation System 3 flight's solid rocket booster's is presented. During the reentry phase of the two Solid Rocket Boosters (SRBs), one 115 ft diameter main parachute failed on the right hand SRB (A12). This parachute failure caused the SRB to impact the Ocean at 110 ft/sec in lieu of the expected 3 parachute impact velocity of 88 ft/sec. This higher impact velocity relates directly to more SRB aft skirt and more motor case damage. The cause of the parachute failure, the potential risks of losing an SRB as a result of this failure, and recommendations to ensure that the

probability of chute failures of this type in the future will be low are discussed.

21I. Rocket Propellants

AD-A118 542/0 PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Non-Steady Combustion of Composite Solid Propellants.
Annual research progress rept. 1 Oct 80-31 Dec 81, N. S. Cohen, and L. D. Strand. Apr 82, 28p JPL-7000-7, AFOSR-TR-82-0654
Grant AFOSR-ISSA-81-0019

No abstract available.

PAT-APPL-6-383 402 PC **A02**/MF **A01**
Department of the Army, Washington, DC.
Apparatus for Determining the Burn Rate of Uncured Propellant.
Patent Application,
Chester W. Huskins, and Leroy J. Williams. Filed 1 Jun 82, 12p AD-D009 668/5
Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

This invention concerns a closed vessel apparatus for rapidly determining the burning rate of uncured propellant. Apparatus includes a closed vessel enclosing a propellant in a holder. An ignition wire is mounted in the vessel for igniting the propellant. A pressure transducers is provided for detecting the pressure rise in the vessel and an electronic circuit triggers the start and stop of pressure integration. This data is fed to a data print out circuit.

22. SPACE TECHNOLOGY

22A. Astronautics

AD-A118 809/3 PC **A04**/MF **A01**
RAND Corp., Santa Monica, CA.
Transmission and Orbital Constraints in Space-Related Programs: Briefing Summary. Addendum,
A. L. Hiebert. Nov 81, 53p Rept no. RAND/P-6713 Addendum to Rept. no. RAND/N-1536-AF, AD-A092 522.

This briefing outlines the project objectives and tasks required to develop a continuing program for predicting and analyzing the spectrum and orbital requirements of current and future space-related systems, and for predicting potential saturation conditions. The product objectives are to design and develop a capability for: (1) predicting and analyzing spectrum/orbital requirements of current and projected U.S. and international space-related programs, (2) evaluating engineering and architectural designs, (3) identifying and analyzing intentional/unintentional EMI, (4) predicting saturation in spectrum usage/orbital positions, (5) assessing means to accommodate growth, and (6) supporting preparations for space services WARC.

N82-29337/4 PC **A03**/MF **A01**
General Dynamics/Convair, San Diego, CA.
Space Construction Experiment Definition Study (SCEDS), Part 2. Volume 1: Executive Summary.
Final Report.
26 Apr 82, 32p NASA-CR-167635, NAS 1.26:167635
Contract NAS9-16303

A baseline Space Construction Experiment (SCE) concept is defined. Five characteristics were incorporated: (1) large space system (LSS) element test, (2) shuttle mission payload of opportunity, (3) attachment to Orbiter with jettison capability, (4) Orbiter flight control capabilities, and (5) LSS construction and assembly operations.

N82-29338/2 PC **A07**/MF **A01**
General Dynamics/Convair, San Diego, CA.
Space Construction Experiment Definition Study (Sceds), Part 2. Volume 2: Study Results.
Final Report.
26 Apr 82, 148p NASA-CR-167632, NAS 1.26:167632
Contract NAS9-16303

The Space Construction Experiment (SCE) was defined for integration into the Space Shuttle. This included development of flight assignment data, revision and update of preliminary mission timelines and test plans, analysis of flight safety issues, and definition of ground operations scenarios. New requirements for the flight experiment and changes for a large space antenna feed mask test article were incorporated. The program plan and cost estimates were updated. Revised SCE structural dynamics characteristics were provided for simulation and analysis of experimental tests to define and verify control limits and interactions effects between the SCE and the Orbiter digital automatic pilot.

N82-29339/0 PC **A08**/MF **A01**
RCA Labs., Princeton, NJ.
Advanced Multipurpose Rendezvous Tracking System Study.
Final Report, 11 Nov. 1980 - 1 Dec. 1981.
R. J. Laurie, and F. Sterzer. 1 Jun 82, 161p NASA-CR-167708, NAS 1.26:167708
Contract NAS9-16252

Rendezvous and docking (R&D) sensors needed to support Earth orbital operations of vehicles were investigated to determine the form they should take. An R&D sensor must enable an interceptor vehicle to determine both the relative position and the relative attitude of a target vehicle. Relative position determination is fairly straightforward and places few constraints on the sensor. Relative attitude determination, however, is more difficult. The attitude is calculated based on relative position measurements of several reflectors placed in a known arrangement on the target vehicle. The constraints imposed on the sensor by the attitude determination method are severe. Narrow beamwidth, wide field of view (fov), high range accuracy, and fast random scan capability are all required to determine attitude by this method. A consideration of these constraints as well as others imposed by expected operating conditions and the available technology led to the conclusion that the sensor should be a cw optical radar employing a semiconductor laser transmitter and an image dissector receiver.

N82-29340/8 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
The Processing and Data Communication Resources for the Brazilian Complete Space Missions.
E. W. Bergamini. Mar 82, 22p INPE-2345-PRE/089
Presented at the International Workshop on Space Data Systems (Inwsds), Washington, D.C., 19-21 Jan. 1982.

The functional segments that constitute the processing and data communication resources planned for the Brazilian complete space mission are presented. These segments are characterized by eight functional parts: (1) space control data network system - REDACE System; (2) ground station supervision; (3) payload ground data acquisition and routing; (4) distributed processing in the Earth stations; (5) missions control center; (6) mission operations center; (7) mission center; and (8) on board data handling. The development of these resources are significantly based on the application of distributed processing to local systems and networks.

22B. Spacecraft

AD-A118 791/3 PC **A03**/MF **A01**
Air Force Geophysics Lab., Hanscom AFB, MA.
High-Level Spacecraft Charging Environments Near Geosynchronous Orbit.
Environmental research papers,
E. G. Mullen, and M. S. Gussenhoven. 11 Feb 82, 49p Rept nos. AFGL-TR-82-0063, AFGL-ERP-771

High-level spacecraft charging events in sunlight are discussed and statistically analyzed to determine environmental parameters critical to charging and the region of space near geosynchronous altitude where charging occurs. Significant levels of spacecraft charging are shown to occur only between 1900 LT and 0900 LT at any altitude or latitude of the SCATHA satellite orbit. High-level charging is shown to occur only during periods when the magnetic activity index is 2+ or greater. Distribution functions of energetic electrons and ions are presented for 3 high-level charging periods on days 114, 241 and 363, 1979. Moments of the distribution functions are determined, and fitting techniques used to derive two-Maxwellian densities and temperatures are discussed. Results are provided in a format usable in satellite design specifications.

N82-29344/0 PC **A06**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Space Systems Lab.
Filter Failure Detection for Systems with Large Space Structure Dynamics.
M.S. Thesis.
C. R. Carignan. Jun 82, 107p NASA-CR-169146, NAS 1.26:169146
Contract NAG1-126

A failure detection filter is applied to the detection of actuator and sensor failures on a free-free beam. Computer simulation tests are used to verify the filter design and study the effect of unmodeled modes on filter performance. In actuator tests, the failure signal to spillover noise ratio was found to be greatest when the filter bandwidth was 5 rad/sec beyond the input frequency. Observation spillover, however, was found to vary widely in tests run under similar conditions (same input frequency and filter poles) but with different detector gains. In sensor tests, the maximum signal-to-noise ratio for varying filter bandwidth depended upon the initial conditions placed on the unmodeled modes; the performance was good even for initial amplitudes on the first unmodeled mode 7.5% of that on the last modeled mode.

N82-29347/3 PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Prelaunch Estimates of Near Earth Satellite Lifetimes Using Quasi-Dynamic Atmosphere Models - Application to a Proposed Brazilian Satellite.
N. S. Venkataraman, and K. R. Rao. Feb 82, 22p INPE-2325-PRE/080
Submitted for Publication.

A rapid prelaunch estimate of near Earth satellite lifetimes using the small perturbation theory is calculated. A quasi-dynamic atmospheric model is used employing a different exospheric temperature every three months. The drag coefficient is calculated using kinetic theory.

N82-29351/5 PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Designing Dual-Plate Meteoroid Shields: A New Analysis.
H. F. Swift, R. Bamford, and R. Chen. 1 Mar 82, 98p NASA-CR-169143, JPL-PUBL-82-39
Contract NAS7-100

Physics governing ultrahigh velocity impacts onto dual-plate meteor armor is discussed. Meteoroid shield design methodologies are considered: failure mechanisms, qualitative features of effective meteoroid shield designs, evaluating/processing meteoroid threat models, and quantitative techniques for optimizing effective meteoroid shield designs. Related investigations are included: use of Kevlar cloth/epoxy panels in meteoroid shields for the Halley's Comet intercept vehicle, mirror exposure dynamics, and evaluation of ion fields produced around the Halley Intercept Mission vehicle by meteoroid impacts.

N82-29352/3 PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.

Spacecraft Drag-Free Technology Development: On-Board Estimation and Control Synthesis.
R. W. Key, E. Mettler, M. H. Milman, and D. B. Schaechter. 15 May 82, 89p NASA-CR-169141, JPL-PUBL-82-45
Sponsored by NASA.

Estimation and control methods for a Drag-Free spacecraft are discussed. The functional and analytical synthesis of on-board estimators and controllers for an integrated attitude and translation control system is represented. The framework for detail definition and design of the baseline drag-free system is created. The techniques for solution of self-gravity and electrostatic charging problems are applicable generally, as is the control system development.

N82-29353/1 PC **A06**/MF **A01**
Boeing Co., Seattle, WA.
Development of Preliminary Design Concept for Multifunction Display and Control System for Orbiter Crew Station. Task 3: Concept Analysis.
Progress Report.
R. J. Spiger, R. J. Farrell, and G. A. Holcomb. 1982, 119p NASA-CR-167709, NAS 1.26:167709
Contract NAS9-16445

The access schema developed to access both individual switch functions as well as automated or semiautomated procedures for the orbital maneuvering system and electrical power and distribution and control system discussed and the operation of the system is described. Feasibility tests and analyses used to define display parameters and to select applicable hardware choices for use in such a system are presented and the results are discussed.

N82-29608/8 PC **A02**/MF **A01**
Battelle Columbus Labs., OH.
Evaluation of Bearing Mounting Design and Excessive Wear Phenomena.
Final Report.
J. W. Kannel. 21 Jun 82, 22p NASA-CR-162053, NAS 1.26:162053
Contract NAS8-33576

The effect of bearing thermal growth on the effectiveness of the bearing preload springs on the space shuttle main engine high pressure oxygen turbopump (SSME HPTOP) were examined. The SSME HPTOP turbine end bearings, preload spring, and bearing mounting design were evaluated relative to spalling, excessive ball wear, possible thermal problems, and cage delamination. The magnitude of the thermal stresses required to cause high levels of ball wear were calculated. Plots of maximum sheer stress and maximum reversing shear versus the axial load for the 57 mm SSME HPTOP bearing were created. A plot of the bearing thermal growth versus preload spring deflection was generated. It was determined that metallic wear, rather than thermal growth, caused enlargement of the contact zone between ball and races, that high fatigue-inducing shear stresses are generated under increased loads, and that at temperatures between 100 and 150 deg C, the springs bottom out and very high loads are developed in the bearing. Allowance for adequate spring movement after assembly is recommended.

N82-29960/3 PC **A10**/MF **A01**
Texas A and M Univ., College Station. Data Processing Center.
The Analysis of the Statistical and Historical Information Gathered During the Development of the Shuttle Orbiter Primary Flight Software.
Final Report.
D. B. Simmons, M. P. Marchbanks, Jr., and M. J. Quick. Jun 82, 217p NASA-CR-169194, NAS 1.26:169194
Contract NCC9-2

The results of an effort to thoroughly and objectively analyze the statistical and historical information gathered during the development of the Shuttle Orbiter Primary Flight Software are given. The particular areas of interest include cost of the software, reliability of the software, requirements for the software and how the requirements changed during development of the system. Data related to the current version of the software system produced some interesting results. Suggestions are made for the saving of additional data which will allow additional investigation.

22C. Spacecraft Trajectories and Reentry

N82-29558/5 PC **A04**/MF **A01**
Missouri Univ.-Rolla. Dept. of Mechanical and Aerospace Engineering.
Effect of a Finite Ionization Rate on the Radiative Heating of Outer Planet Atmospheric Entry Probes.
Final Report.
H. F. Nelson. Jun 82, 69p NASA-CR-3577, NAS 1.26:3577
Contract NAG1-125

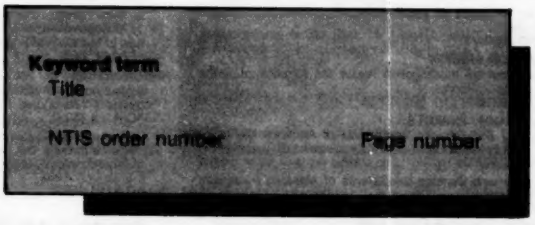
The influence of finite rate ionization in the inviscid gas just behind the stagnation shock wave on the radiative heating of probes entering the hydrogen-helium atmosphere of the major planets was investigated. Two opposing conclusions were reached as to how the ionization rate assumption affects the radiative transfer. Hydrogen-helium shock waves with a cold nonblowing wall boundary condition at the probe heat shield are emphasized. The study is limited to the stagnation shock layer.

KEYWORD INDEX

NTIS®

Index entries in this section are selected to indicate important ideas and concepts presented in a report. When using the keyword index, be sure to look under terms narrower, broader, or related to a particular topic. Although some of the keywords are not selected from a controlled vocabulary of terms, most of them have been selected from the DoD, DoE, NASA, or NTIS controlled vocabularies. The entries are arranged by keyword and then by the NTIS order number.

SAMPLE ENTRY



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PB82-875949 5456

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AD-A118 789/7 5397

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N82-30078/1 5507

Theory of Collision-Induced Line Shapes - Absorption and Light Scattering at Low Density.
PB82-261900 5400

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Absorption Coefficient of Alkali Halides. Part I.
AD-A118 801/0 5397

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PB82-261678 5400

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University of Cincinnati, Central Library, Computerized Bibliographic Retrieval Services: Evaluative Report, July 1979-August 1980,
ED-200 253 5364

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DE82011985 5435

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PB82-265455 5461

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PB82-910407 5342

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PB82-263765 5461

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N82-29959/5 5421

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N82-29974/4 5440

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AD-A118 737/6 5470

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DE82013312 5397

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Stanford Linear Accelerator Center, CA.
DE82014395 5501

AC03-76SF01123
AiResearch Mfg. Co. of Arizona, Phoenix.
DE82008275 5426

AC03-78ET13330
Pratt and Whitney Aircraft, Middletown, CT. Materials Engineering and Research Lab.
DE82008638 5516

AC03-78SF02034
Gas-Cooled Reactor Associates, La Jolla, CA.
DE82007227 5494

AC03-79CS30115
Solar Environmental Engineering Co., Inc., Fort Collins, CO.
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AC03-79CS30202
Hittman Associates, Inc., Columbia, MD.
DE82008266 5441
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AC03-79ET27039
TRW, Inc., Redondo Beach, CA.
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AC03-79ET27124
Biphase Energy Systems, Santa Monica, CA.
DE82008222 5422

AC03-79ET27241
JM Energy Consultants, Inc., Los Angeles, CA.
DE82008172 5359
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Bechtel Group, Inc., San Francisco, CA.
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Stephens Engineering Co., Inc., McLean, VA.
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EarthTech Research Corp., Baltimore, MD.
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Monsanto Research Corp., Miamisburg, OH.
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AC04-76DP00613
Bendix Corp., Kansas City, MO.
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AC04-76DP00789
Sandia National Labs., Albuquerque, NM.
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Sandia National Labs., Livermore, CA.
DE82012873 5420
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AC04-76DP03533
Atomics International Div., Golden, CO. Rocky Flats Plant.
DE82015143 5428

AC04-76EV01013
Lovelace Biomedical and Environmental Research Inst., Albuquerque, NM. Inhalation Toxicology Research Inst.
DE82014389 5386
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AC04-76GJ01658
Ford, Bacon and Davis Utah, Inc., Salt Lake City.
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AC05-76CS20082
Mathematica, Inc., Princeton, NJ. Mathtech Div.
DE82012395 5514

AC05-76OR00033
Oak Ridge Associated Universities, Inc., TN.
DE82013762 5442

AC05-77ET10152
Hydrocarbon Research, Inc., Lawrenceville, NJ.
DE82008214 5393

AC05-78ET20154
TRW, Inc., McLean, VA. Energy Systems Planning Div.
DE82013986 5363

AC05-80RA50158
Philadelphia Electric Co., PA. Engineering and Research Dept.
DE82012312 5418

AC05-81OR20722
Bechtel National, Inc., Oak Ridge, TN.
DE82014345 5483

AC06-76FF02170
Hanford Engineering Development Lab., Richland, WA.
DE82013569 5475
DE82013976 5483
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DE82014188 5489
DE82014192 5501

AC06-76RL01830
Artic Research, Littleton, CO.
DE82015754 5485
Battelle Pacific Northwest Labs., Richland, WA.
DE82007087 5492
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DE82015027 5431
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DE82015172 5383
DE82016223 5358
Battelle Project Management Div., Columbus, OH. Office of Nuclear Waste Isolation.
DE82015756 5493

AC06-77RL01030
Atomics International Div., Richland, WA. Rockwell Hanford Operations.
DE82012541 5482

AC06-79ET34026
Exxon Nuclear Co., Inc., Richland, WA.
DE82008767 5492

AC07-76ID01570
EG and G Idaho, Inc., Idaho Falls.
DE82012826 5482
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Idaho National Engineering Lab., Idaho Falls.
DE82015250 5484
DE82015290 5485
DE82016228 5394

AC07-79ID01675
Exxon Nuclear Idaho Co., Inc., Idaho Falls.
DE82014971 5483

AC08-78DP40030
KMS Fusion, Inc., Ann Arbor, MI.
DE82014596 5417

AC08-81NV10171
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Energy Systems Div.
DE82012567 5482

AC08-82DP40152
KMS Fusion, Inc., Ann Arbor, MI.
DE82014585 5476

AC08-82NV10250
Westinghouse Electric Corp., Mercury, NV. Advanced Energy Systems Div.
DE82016026 5485

AC09-76SR00001
Du Pont de Nemours (E.I.) and Co., Aiken, SC.
DE82000531 5482
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
DE82012341 5408
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DE82014221 5483
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AC09-77SR01008
Virginia Polytechnic Inst. and State Univ., Blacksburg.
DE82011531 5482

AC11-78PN00014
Bettis Atomic Power Lab., West Mifflin, PA.
DE82013734 5489

AC13-76GJ01864
Bendix Field Engineering Corp., Grand Junction, CO.
DE82013263 5405
Bendix Field Engineering Corp., Grand Junction, CO. Grand Junction Operations.
DE82014216 5409

AC19-78BC00042
Institute of Gas Technology, Chicago, IL.
DE82013573 5408

AC19-79BC10079
Tulsa Univ., OK.
DE82015399 5410

AC19-80BC10301
Science Applications, Inc., McLean, VA.
DE82015394 5389

AC21-79ET15457
General Electric Co., Schenectady, NY. Energy Systems Programs Dept.
DE82013322 5516

AC21-79MC08341
Gruy Federal, Inc., Houston, TX.
DE82015485 5410

AC21-80MC14584
Williams Bros. Engineering Co., Tulsa, OK. Process Div.
DE82014584 5409
Williams Bros. Urban Ore, Inc., Tulsa, OK.
DE82014582 5409

AC21-81MC16024
Westinghouse Research and Development Center, Pittsburgh, PA.
DE82012396 5393

AC21-81MC16219
Curtiss-Wright Corp., Wood-Ridge, NJ. Power Systems Div.
DE82003645 5444

AC21-81MC16554
TRW, Inc., McLean, VA.
DE82013029 5408

AC21-81MC19170
PEDCo-Environmental, Inc., Cincinnati, OH.
DE82016914 5445

AC22-75ET12496
Foster-Miller Associates, Inc., Waltham, MA.
DE82015683 5410

AC22-76ET13354
Mathtech, Inc., Princeton, NJ.
DE82006214 5408

AC22-77ET11313
Exxon Research and Engineering Co., Linden, NJ.
DE82013779 5516

AC22-79ET14700
Utah Univ., Salt Lake City. Dept. of Mining and Fuels Engineering.
DE82012474 5393

AC22-80PC30026
Amoco Research Center, Naperville, IL. Research and Development Dept.
DE82008028 5392

AC22-80PC30300
Spectron Development Labs., Inc., Costa Mesa, CA.
DE82014306 5513

AC22-81PC40090
Mechanical Technology, Inc., Fairfax, VA.
DE82014735 5394

AC22-81PC40273
TRW Defense and Space Systems Group, Redondo Beach, CA. Fluid Thermochemistry Dept.
DE82013693 5394

AC22-81PC40785
SRI International, Menlo Park, CA.
DE82013414 5393

AC97-80ET46615
Texas Univ. at Austin. Bureau of Economic Geology.
DE82013768 5405

AFOSR-ISSA-81-0019
Jet Propulsion Lab., Pasadena, CA.
AD-A118 542/0 5518

AFOSR-73-2430
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Mathematics.
AD-A118 533/9 5396

AFOSR-76-2922
Mississippi State Univ., Mississippi State. Dept. of Aerophysics and Aerospace Engineering.
AD-A118 547/9 5439

AFOSR-76-2981
Texas Univ. at Arlington. Dept. of Physics.
AD-A118 842/4 5511

AFOSR-76-3052
Princeton Univ., NJ. Dept. of Mechanical and Aerospace Engineering.
AD-A118 641/0 5513

AFOSR-77-3131
Technion - Israel Inst. of Tech., Haifa. Center of Human Engineering and Industrial Safey Research.
AD-A118 558/6 5371
AD-A118 559/4 5371

AFOSR-77-3215
Hull Univ. (England). Dept. of Chemistry.
AD-A118 540/4 5396

AFOSR-77-3241
State Univ. of New York at Albany. Dept. of Chemistry.
AD-A118 552/9 5395

AFOSR-77-3269
Harvard Univ., Cambridge, MA. Dept. of Chemistry.
AD-A118 698/0 5499

AFOSR-77-3290
Texas A and M Univ., College Station. Dept. of Mathematics.
AD-A118 551/1 5510
AD-A118 579/2 5433

AFOSR-77-3303
Toronto Univ., Downsview (Ontario). Inst. for Aerospace Studies.
AD-A118 588/3 5507

AFOSR-77-3426
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Electrical Computer and Systems Engineering.
AD-A118 536/2 5510
AD-A118 541/2 5510

AFOSR-77-3457
Houston Univ., TX. Dept. of Electrical Engineering.
AD-A118 587/5 5465

AFOSR-78-3473
Rensselaer Polytechnic Inst., Troy, NY. Dept. of Mechanical Engineering, Aeronautical Engineering and Mechanics.
AD-A118 555/2 5438

AFOSR-78-3590
Virginia Univ., Charlottesville. Dept. of Chemistry.
AD-A118 699/8 5499

AFOSR-78-3691
Wisconsin Univ.-Madison. Motor Behavior Lab.
AD-A118 575/0 5377

AFOSR-78-3725
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.
AD-A118 537/0 5402

AFOSR-79-0069
California Univ., Davis. Dept. of Mechanical Engineering.
AD-A118 614/7 5434

AFOSR-80-0051
North Carolina State Univ. at Raleigh. Dept. of Physics.
AD-A118 515/6 5500
AD-A118 664/2 5501

AFOSR-80-0068
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mathematics.
AD-A118 448/4 5341

AFOSR-80-0155
Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering.
AD-A118 534/7 5439

AFOSR-80-0171
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
AD-A118 561/0 5472

AFOSR-80-0182
South Carolina Univ., Columbia. Coll. of Engineering.
AD-A118 591/7 5341

AFOSR-80-0185
Mississippi State Univ., Mississippi State. Dept. of Aerophysics and Aerospace Engineering.
AD-A118 547/9 5439

AFOSR-80-0188
Massachusetts Inst. of Tech., Cambridge. Francis Bitter National Magnet Lab.
AD-A118 653/5 5500

AFOSR-80-0209
Brigham Young Univ., Provo, UT. Dept. of Microbiology.
AD-A118 524/8 5380
AD-A118 530/5 5380

AFOSR-80-0212
Stanford Univ., CA. Dept. of Computer Science.
AD-A118 535/4 5439

AFOSR-80-0225
Massachusetts Inst. of Tech., Cambridge. Dept. of Electrical Engineering and Computer Science.
AD-A118 570/1 5415

AFOSR-81-0024
Northwestern Univ., Evanston, IL. Dept. of Physics and Astronomy.
AD-A118 556/0 5396

AFOSR-81-0068
New Mexico Univ., Albuquerque. Dept. of Biology.
AD-A118 746/7 5391

AFOSR-81-0080
Texas Univ. at Austin. Dept. of Computer Sciences.
AD-A118 577/6 5415

AFOSR-81-0093
Tennessee Univ., Knoxville. Plasma Science Lab.
AD-A118 557/8 5507

AFOSR-81-0102
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Civil Engineering.
AD-A118 610/5 5345

AFOSR-81-0105
Kansas Univ., Lawrence. Dept. of Chemistry.
AD-A118 578/4 5354

AFOSR-81-0135
Massachusetts Inst. of Tech., Cambridge. Man Vehicle Lab.
AD-A118 491/0 5474

AFOSR-81-0136
District of Columbia Univ., Washington. Dept. of Biology.
AD-A118 560/2 5391

AFOSR-81-0176
San Jose State Univ., CA. School of Engineering.
AD-A118 611/3 5420

AI01-76ET20356
Jet Propulsion Lab., Pasadena, CA.
DE82016001 5428

AI01-77ET13111
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
DE82015504 5513

AI01-78CS54209
Jet Propulsion Lab., Pasadena, CA.
DE82013934 5454

AI01-80ER10168
Naval Research Lab., Washington, DC.
DE82012254 5438

AID-DSAN-C-0065
Development Alternatives, Inc., Washington, DC.
PB82-260258 5361

AID-DSAN-G-0083
International Rice Research Inst., Los Banos, Laguna (Philippines).
PB82-260142 5349

AID/DSPE-C-0051
Academy for Educational Development, Inc., Washington, DC.
PB82-260209 5371

AID/DSPE-C-0075
Creative Associates, Washington, DC.
PB82-258666 5374

AID/DSPE-CA-0043
Columbia Univ., New York.
PB82-259573 5381

AID/OTR-C-1788
Berger (Louis) International, Inc., East Orange, NJ.
PB82-259581 5445

AID/TA-BMA-7
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.
PB82-260167 5367
PB82-260316 5367
PB82-260324 5367

AID/TA-BMA-8
Cornell Univ., Ithaca, NY. Rural Development Committee.
PB82-259391 5374
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PB82-259508 5361
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PB82-260266 5367
PB82-260357 5367

AID/TA-C-1354
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
PB82-260191 5459

AID/TA-C-1356
Maxwell School of Citizenship and Public Affairs, Syracuse, NY.
PB82-259441 5367

AID/TA-CA-1
Research Triangle Inst., Research Triangle Park, NC.
PB82-260290 5378

AID/TA-G-1218
International Fertilizer Development Center, Muscle Shoals, AL.
PB82-260175 5346

AID/TA-G-1406
International Crops Research Inst. for the Semi-Arid Tropics, Hyderabad (India).
PB82-260340 5347

AM01-76EI02295
Massachusetts Inst. of Tech., Cambridge. Energy Lab.
DE82013631 5419

AM06-77RL00600
Westinghouse Research and Development Center, Pittsburgh, PA.
DE82013398 5427
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ARO-MIPR-12-82
National Marine Fisheries Service, Seattle, WA. Northwest and Alaska Fisheries Center.
AD-A118 628/7 5379

ARPA ORDER-2551
Systems, Science and Software, La Jolla, CA.
AD-A118 503/2 5413

ARPA ORDER-3800
Spire Corp., Bedford, MA.
AD-A118 654/3 5496

AS01-76ET10589
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
DE82015005 5398

AS02-76ER03244
Pittsburgh Univ., PA. Dept. of Physics.
DE82011582 5502

AS02-76ER04060
Yale Univ., New Haven, CT. Dept. of Chemistry.
DE82013312 5397

AS02-76ET37227
Wisconsin Univ.-Milwaukee. Dept. of Mechanical Engineering.
DE82013547 5488

AS02-76ET37240
Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.
DE82007743 5488

AS02-76ET53016
Columbia Univ., New York. Plasma Physics Lab.
DE82014385 5508

AS02-77ER04463
Pennsylvania State Univ., University Park. Dept. of Chemical Engineering.
DE82013968 5398

AS02-79ER10423
Minnesota Univ., Minneapolis. School of Physics and Astronomy.
DE82011280 5502

AS05-76EV04106
North Carolina Univ. at Chapel Hill. Dept. of Surgery.
DE82009634 5390

AS05-76ET27161
University of Southwestern Louisiana, Lafayette.
DE82016044 5411

AS05-79ER10512
Tennessee Univ., Knoxville.
DE82013939 5397

AS05-79ET27015
Alabama Univ. in Birmingham.
DE82005741 5408

AS07-76ID01638
Idaho Univ., Moscow. Coll. of Mines and Earth Resources.
DE82014266 5409

AS07-77ID01674
Brigham Young Univ., Provo, UT. Dept. of Zoology.
DE82014301 5383

AS09-77SR01036
Mississippi State Univ., Mississippi State. Dept. of Nuclear Engineering.
DE82015233 5483

AS09-80ER10683
Georgia Univ., Athens. Dept. of Microbiology.
DE82014606 5389

AT03-76ER70057
Stanford Univ., CA. Dept. of Materials Science and Engineering.
DE82013040 5435

AT03-76ER70107
California Univ., Riverside.
DE82008231 5502

AT03-76ET35301
General Atomic Co., San Diego, CA.
DE82015239 5440

AT03-76SF71031
General Electric Co., Sunnyvale, CA. Advanced Reactor Systems Dept.
DE82008070 5492
DE82008287 5492

AT03-76SF77011
General Electric Co., San Jose, CA. Nuclear Engineering Div.
DE82014600 5492
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AT04-81AL16228
Jet Propulsion Lab., Pasadena, CA.
DE82016006 5424

AT06-76ER70004
Oregon Univ., Eugene. Inst. of Theoretical Science.
DE82008366 5502

CSA-ABB-0016
National Bureau of Standards, Washington, DC. National Engineering Lab.
PB82-260811 5462

DA-ERO-78-G-104
Bristol Univ. (England).
AD-A118 687/3 5407

DA PROJ. 1L1-62209-AH-76
Teledyne CAE, Toledo, OH.
N82-29323/4 5517

DA-49-193-MD-2497
Peter Bent Brigham Hospital, Boston, MA.
AD-A118 759/0 5380

DAAB07-76-C-0041
Erie Technological Products of Canada Ltd., Trenton (Ontario).
AD-A118 783/0 5420

DAAB08-77-C-0375
Litton Systems, Inc., Morris Plains, NJ. Airtron Div.
AD-A118 748/3 5496

DAAG29-76-G-0326
Virginia Univ., Charlottesville. Dept. of Chemistry.
AD-A118 726/9 5397

DAAG29-77-G-0095
Massachusetts Univ., Amherst. Dept. of Civil Engineering.
AD-A118 600/6 5510

DAAG29-78-G-0194
Princeton Univ., NJ. Dept. of Mechanical and Aerospace Engineering.
AD-A118 609/7 5343

DAAG29-79-C-0079
Columbia Radiation Lab. New York.
AD-A118 624/6 5396
AD-A118 625/3 5396
AD-A118 626/1 5510
AD-A118 627/9 5396

DAAG29-79-C-0176
Colorado State Univ., Fort Collins.
AD-A118 613/9 5419

DAAG29-79-C-0183
Northwestern Univ., Evanston, IL. Dept. of Engineering Science and Applied Mathematics.
AD-A118 652/7 5513

DAAG29-79-C-0195
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
AD-A118 630/3 5395

DAAG29-79-G-0012
Colorado Univ. at Boulder. Dept. of Chemistry.
AD-A118 636/0 5395

DAAG29-79-G-0043
Pennsylvania State Univ., University Park. Dept. of Microbiology.
AD-A118 655/0 5389

DAAG29-80-C-0020
Rochester Univ., NY. Dept. of Physics and Astronomy.
AD-A118 637/8 5500
AD-A118 645/1 5500

DAAG29-80-C-0041
Wisconsin Univ.-Madison. Mathematics Research Center.
AD-A118 597/4 5497
AD-A118 598/2 5440
AD-A118 599/0 5440
AD-A118 606/3 5440
AD-A118 607/1 5440
AD-A118 617/0 5497

DAAG29-80-C-0101
Virginia Univ., Charlottesville. Dept. of Chemistry.
AD-A118 726/9 5397

DAAG29-80-C-0120
Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
AD-A118 840/8 5416

DAAG29-80-C-0144
McGill Univ., Montreal (Quebec). Dept. of Chemistry.
AD-A118 661/8 5438

DAAG29-80-K-0068
Wisconsin Univ.-Madison. Dept. of Metallurgical and Mineral Engineering.
AD-A118 619/6 5434

DAAG29-80-K-0096
Princeton Univ., NJ. Dept. of Mechanical and Aerospace Engineering.
AD-A118 609/7 5343

DAAG29-81-D-0100
Northrop Services, Inc., Research Triangle Park, NC.
AD-A118 697/2 5391

DAAG29-81-K-0033
Minnesota Univ., Minneapolis. Dept. of Electrical Engineering.
AD-A118 620/4 5500

DAAG29-81-K-0051
Colorado State Univ., Fort Collins. Dept. of Electrical Engineering.
AD-A118 629/5 5414

DAAG29-82-K-0008
Wayne State Univ., Detroit, MI. Dept. of Chemistry.
AD-A118 727/7 5402

DAAG29-82-K-0080
Columbia Radiation Lab. New York.
AD-A118 626/1 5510

DAAK10-80-C-0031
Polytechnic Inst. of New York, Brooklyn. Dept. of Chemistry.
AD-A118 671/7 5395

DAAK20-81-C-0381
Honeywell Power Sources Center, Horsham, PA.
AD-A118 696/4 5431

DAAK21-79-C-0017
Honeywell, Inc., Hopkins, MN. Defense Systems Div.
AD-A118 714/5 5438

DAAK21-81-C-0116
Florida Univ., Gainesville.
AD-A118 460/5 5419

DAAK51-81-C-0034
Bell Helicopter Textron, Fort Worth, TX.
AD-A118 827/5 5344

DAAK60-77-C-0076
AAI Corp., Cockeysville, MD.
AD-A118 737/6 5470

DAAK60-79-C-0015
National Research Council, Washington, DC. Advisory Board on Military Personnel Supplies.
PB82-260878 5385

DAAK60-79-C-0131
Pennsylvania State Univ., University Park. Biomechanics Lab.
AD-A118 659/2 5390

DAAK70-77-C-0032
Solar Turbines, Inc., San Diego, CA. Turbomach Div.
AD-A118 810/1 5516

DAAK70-80-C-0001
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
AD-A118 573/5 5438

DAAK70-82-C-0001
Southwest Research Inst., San Antonio, TX. Army Fuels and Lubricants Research Lab.
AD-A118 573/5 5438

DACW05-80-C-0083
Iowa Inst. of Hydraulic Research, Iowa City.
PB82-264987 5450

DACW25-81-C-0045
Great Lakes Archaeological Research Center, Inc., Waukesha, WI.
AD-A118 797/0 5370
AD-A118 798/8 5370
AD-A118 799/6 5370

DACW29-79-C-0265
University of Southwestern Louisiana, Lafayette. Center for Archaeological Studies.
AD-A118 569/3 5370

DACW29-80-D-0107
Iroquois Research Inst., Fairfax, VA.
AD-A118 563/6 5369
AD-A118 564/4 5369
AD-A118 565/1 5370
AD-A118 568/5 5370

DACW39-76-C-0076
Florida Univ., Gainesville. Dept. of Environmental Engineering Sciences.
AD-A118 700/4 5407

DACW39-76-C-0084
Orange County Pollution Control Dept., Orange, FL.
AD-A118 701/2 5383

DACW39-80-C-0129
Iowa Inst. of Hydraulic Research, Iowa City.
PB82-264987 5450

DAMD17-74-C-4023
Peter Bent Brigham Hospital, Boston, MA.
AD-A118 759/0 5380

DAMD17-77-C-7018
California Univ., Berkeley. Naval Biosciences Lab.
AD-A118 631/1 5379

DAMD17-78-C-8073
Little (Arthur D.), Inc., Cambridge, MA.
AD-A118 754/1 5395

DAMD17-78-C-8087
JAYCOR, Alexandria, VA.
AD-A118 823/4 5496

DAMD17-80-C-0179
Exxon Research and Engineering Co., Linden, NJ.
AD-A118 818/4 5379

DAMD17-82-C-2005
Columbia Univ., New York. Coll. of Physicians and Surgeons.
AD-A118 812/7 5389

DAND17-82-G-9509
National Research Council, Washington, DC.
PB82-262700 5385

DARPA ORDER-2551
Teledyne Geotech, Alexandria, VA. Seismic Data Analysis Center.
AD-A118 778/0 5413

DARPA ORDER-3119
University of Southern California, Los Angeles.
AD-A118 738/4 5403

DARPA ORDER-4001
Motorola, Inc., Scottsdale, AZ.
AD-A118 550/3 5420

DE-AC02-76CH00016
Brookhaven National Lab., Upton, NY.
NUREG/CR-2617 5486

DE-AC04-76DP00789
Sandia National Labs., Albuquerque, NM.

NUREG/CR-2646 5491

DE-AC07-76IDO1570
EG and G Idaho, Inc., Idaho Falls.
NUREG/CR-2757 5493
NUREG/CR-2826 5491

DE-AI01-76PR06010
National Bureau of Standards, Washington, DC. National Engineering Lab.
PB82-263336 5464

DE-AI01-77ET-10350
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
N82-29717/7 5517

DE-AI01-80CS-30507
Jet Propulsion Lab., Pasadena, CA.
N82-29716/9 5429

DE-AI01-80ET-17088
Aerospace Corp., El Segundo, CA.
N82-29721/9 5429
California Univ., Berkeley. Earl Warren Legal Inst.
N82-29719/3 5429
Institute of Gas Technology, Chicago, IL. Engineering Research Div.
N82-29718/5 5429

DEN3-208
Institute of Gas Technology, Chicago, IL. Engineering Research Div.
N82-29718/5 5429

DEN3-248
DHR, Inc., Washington, DC.
N82-29720/1 5429

DHEW-200-75-0542
American Hospital Association, Chicago, IL.
PB82-263427 5382

DHHS-ACYF-80-C-600
Wisconsin Univ.-Milwaukee. Region V Child Abuse and Neglect Resource Center.
PB82-263476 5365

DI-AA851-CT0-69
Futures Group, Inc., Glastonbury, CT.
PB82-265568 5451

DI-AA851-CTO-69
Futures Group, Inc., Glastonbury, CT.
PB82-265570 5451

DI-0-07-DV-00031
Tudor Engineering Co., Denver, CO.
PB82-260720 5430
PB82-260738 5430
PB82-260746 5430
PB82-260753 5430
PB82-260761 5430
PB82-260779 5430
PB82-260787 5430

DI-5-07-01-X0330
Southern Methodist Univ., Dallas, TX. Archaeology Research Program.
PB82-263682 5370

DI-14-16-0009-78-017
National Museum of Natural History, Washington, DC.
PB82-264995 5403

DI-14-16-0009-79-068
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
PB82-263518 5449

DI-14-16-009-80-061
Baker (Michael), Jr., Inc., Beaver, PA.
PB82-262635 5448

DI-14-34-0001-9072
Iowa Inst. of Hydraulic Research, Iowa City.
PB82-263047 5448

DL-J-9-F-5-0070
National Materials Advisory Board (NRC), Washington, DC.
PB82-263153 5419
PB82-263179 5419

DL-21-49-80-06
Olympus Research Centers, Salt Lake City, UT.
PB82-260480 5375
PB82-260654 5375
PB82-263195 5376

DL-51-34-80-03
Educational Testing Service, Princeton, NJ.
PB82-263187 5376

DL-51-42-79-02
Center for Research on the Acts of Man, Philadelphia, PA.
PB82-253006 5377

DL-91-24-79-17
Maryland Univ., College Park.
PB82-265547 5369

DNA001-79-C-0473
JRB Associates, Inc., McLean, VA.
AD-A118 680/8 5478
AD-A118 681/6 5478
AD-A118 683/2 5478
AD-A118 684/0 5478

DNA001-80-C-0351
Mission Research Corp., Santa Barbara, CA.
AD-A118 456/3 5460

DOT-AS-800
National Bureau of Standards, Washington, DC.
PB82-261496 5436

DOT-CG-833401
Norske Veritas, Oslo.
PB82-265281 5459

DOT-CG-948071
National Materials Advisory Board (NRC), Washington, DC.
PB82-263161 5459

DOT-FA-79NA-6040
Embry-Riddle Aeronautical Univ., Daytona Beach, FL.
AD-A118 604/8 5345

DOT-FH-11-8168
Ohio State Univ., Columbus.
PB82-262437 5453

DOT-FH-11-9246
JHK and Associates, Alexandria, VA.
PB82-263351 5449

DOT-FH-11-9291
BioTechnology, Inc., Falls Church, VA.
PB82-266107 5451
PB82-266115 5451
PB82-266123 5451

DOT-FH-11-9307
Ohio State Univ., Columbus.
PB82-262437 5453

DOT-FH-11-9516
Goldberg-Zoino and Associates, Inc., Newton Upper Falls, MA.
PB82-261736 5447
PB82-261744 5447
PB82-261751 5447
PB82-261769 5447

DOT-HS-7-01724
Human Factors Research, Inc., Goleta, CA.
PB82-266826 5455

DOT-HS-9-02110
Corporate-Tech Planning, Inc., Waltham, MA.
PB82-265364 5517

DOT-HS-9-02274
Dynamic Science, Inc., Phoenix, AZ.
PB82-255175 5460

DOT-TSC-1416
SYSTAN, Inc., Los Altos, CA.
PB82-258708 5454

DOT-UMTA-CA-06-0098
California State Div. of Mass Transportation, Sacramento.
PB82-260431 5455

DOT-UMTA-IL-11-0028
Illinois Univ. at Chicago Circle.
PB82-260704 5446

DOT-UMTA-PA-06-0059
Carnegie-Mellon Univ., Pittsburgh, PA. Rail Systems Center.
PB82-260118 5455

DOT-UMTA-80-80-C-71023
Booz-Allen and Hamilton, Inc., Bethesda, MD.
PB82-263005 5455

DT-FA01-80-Y-10595
H.H. Aerospace Design Co., Inc., Bedford, MA.
AD-A118 828/3 5345

DTF61-80-C-00090
Sheladia Associates, Inc., Riverdale, MD.
PB82-263294 5448

DTFA01-80-Y-30528
Naval Aerospace Medical Research Lab., Pensacola, FL.
AD-A118 803/6 5372

DTFH61-80-C-00089
Automated Management Systems, Inc., Landover, MD.
PB82-260449 5446

DTNH22-80-C-01040
California State Dept. of Motor Vehicles, Sacramento.
PB82-265018 5450

DTNH22-80-C-15158
Indiana Univ. at Bloomington. Inst. for Research in Public Safety.
PB82-263658 5449

DTRS57-80-X-00103
Jet Propulsion Lab., Pasadena, CA.
PB82-258716 5454

DTUM60-81-C-71096
Engineering Foundation, New York.
PB82-265166 5450

DTUM60-81-C-72052
Transportation Research Board, Washington, DC.
PB82-263039 5448

EC-77-A-31-1042
Army Mobility Equipment Research and Development Command, Fort Belvoir, VA.
AD-A118 718/6 5454
AD-A118 741/8 5454

EDA-04-06-18005-01
Haliwa-Saponi Tribe, Hollister, NC.
PB82-255746 5366

EDA-06-06-01811-40
Hulman Regional Airport Authority, Terre Haute, IN.
PB82-257262 5366

EDA-07-6-02252
Navajo Tribe, Window Rock, AZ. Div. of Economic Development.
PB82-255936 5366

EDA-99-06-07028
National Educational Inst. for Economic Development, Washington, DC.
PB82-262098 5375

EPA-R-803157
American Public Works Association, Chicago, IL.
PB82-266172 5451

EPA-R-805497
Florida Univ., Gainesville.
PB82-262890 5448

EPA-R-805811
Colorado State Univ., Fort Collins. Dept. of Agricultural and Chemical Engineering.
PB82-255324 5349

EPA-R-806225
Oregon State Univ., Corvallis. Dept. of Electrical and Computer Engineering.
PB82-261447 5447

EPA-R-806189010
Maryland Univ., Solomons. Chesapeake Biological Lab.
PB82-265471 5451

EPA-T-901113
International Brotherhood of Police Officers, Boston, MA.
PB82-254707 5445

EPA-68-01-3948
Wyle Labs., El Segundo, CA.
PB82-259037 5454
PB82-259045 5455

EPA-68-01-5838
Public Interest Economics Center, Washington, DC.
PB82-260670 5446

EPA-68-01-5845
Temple, Barker and Sloane, Inc., Lexington, MA.
PB82-256983 5445

EPA-68-01-6093
Energy Resources Co., Inc., Vienna, VA.
PB82-259060 5455
PB82-259078 5455
PB82-259086 5455
PB82-259102 5367
PB82-259110 5367
PB82-259128 5367

EPA-68-02-2539
GCA Corp., Bedford, MA. GCA Technology Div.
PB82-266214 5452

EPA-68-02-3671
Hoffman-Holt, Inc., Silver Spring, MD.
PB82-260886 5515

EPA-68-03-2753
Weston (Roy F.), Inc., West Chester, PA.
PB82-260829 5448

EPA-68-03-2928
Midwest Research Inst., Kansas City, MO.
PB82-263732 5392

EPA-78-D-X0426
Anne Arundel Community Coll., Arnold, MD. Environmental Center.
PB82-265489 5403

EPA-79-D-X-0717
National Bureau of Standards, Washington, DC.
PB82-265265 5450

EPA-806844
California Inst. of Tech., Pasadena. Dept. of Chemical Engineering.
PB82-261413 5399

ER-78-C-01-3183
Aerodyne Research, Inc., Bedford, MA. Center for Chemical and Environmental Physics.
DE82012705 5397

F08606-79-C-0007
Teledyne Geotech, Alexandria, VA. Seismic Data Analysis Center.
AD-A118 778/0 5413

F08606-79-C-0008
Systems, Science and Software, La Jolla, CA.
AD-A118 503/2 5413

F08637-80-G-0009
Engineering-Science, Inc., Atlanta, GA.
AD-A118 615/4 5444

F08637-80-G-0010
CH2M/Hill, Gainesville, FL.
AD-A118 608/9 5443

F19628-79-C-0088
Aerospace Corp., El Segundo, CA. Engineering Science Operations.
AD-A118 723/6 5354

F19628-79-C-0099
Panametrics, Inc., Waltham, MA.
AD-A118 724/4 5479

F19628-80-C-0002
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
AD-A118 847/3 5420

F19628-80-C-0060
Tufts Univ., Medford, MA. Dept. of Electrical Engineering.
AD-A118 770/7 5343

F19628-80-C-0198
Frequency Electronics, Inc., New Hyde Park, NY.
AD-A118 764/0 5414

F19628-80-K-0089
Massachusetts Inst. of Tech., Cambridge. Aerophysics Lab.
AD-A118 774/9 5357

F19628-81-C-0001
MITRE Corp., Bedford, MA.
AD-A118 476/1 5470

F19628-81-C-0026
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
AD-A118 763/2 5474

F19628-81-C-0039
Systems and Applied Sciences Corp., Riverdale, MD.
AD-A118 744/2 5357

F19628-81-C-0042
Systems and Applied Sciences Corp., Riverdale, MD.
AD-A118 775/6 5354

F29601-80-C-0005
Kulite Semiconductor Products, Inc., Ridgefield, NJ.
AD-A118 566/9 5465

F30602-77-0068
National Bureau of Standards, Washington, DC.
PB82-264243 5418

F30602-79-C-0124
Rhode Island Univ., Kingston. Dept. of Computer Science and Statistics.
AD-A118 813/5 5416
AD-A118 814/3 5416

F30602-79-C-0230
Comarco, Inc., Anahiem, CA.
AD-A118 567/7 5343

F30602-80-C-0106
McDonnell Douglas Research Labs., St. Louis, MO.
AD-A118 459/7 5419
AD-A118 497/7 5420
AD-A118 498/5 5420

F30602-80-C-0200
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Electrical Engineering.
AD-A118 826/7 5416

F30602-80-C-0244
SofTech, Inc., Dayton, OH.
AD-A118 825/9 5416

F30602-81-C-0033
Hughes Aircraft Co., Culver City, CA.
AD-A118 839/0 5469

F30602-81-C-0053
Boeing Aerospace Co., Houston, TX.
AD-A118 479/5 5415

F33615-77-C-3121
Rockwell International, Los Angeles, CA. North American Aircraft Operations.
AD-A118 856/4 5344
AD-A118 857/2 5344

F33615-77-C-3122
Dayton Univ., OH. Research Inst.
AD-A118 858/0 5344
AD-A118 859/8 5344
AD-A118 860/6 5344

F33615-78-C-1444
Hughes Research Labs., Malibu, CA.
AD-A118 777/2 5510

F33615-78-C-2019
Battelle Memorial Inst., Columbus, OH. Columbus Labs.
AD-A118 838/2 5395

F33615-80-C-0009
National Research Council, Washington, DC. Assembly of Behavioral and Social Sciences.
AD-A118 721/0 5371

F33615-80-C-1080
University of Southern California, Los Angeles.
AD-A118 738/4 5403

F33615-80-C-2071
Martin Marietta Aerospace, Denver, CO. Denver Div.
AD-A118 477/9 5438

F33615-81-C-2073
Monsanto Research Corp., Dayton, OH. Dayton Lab.
AD-A118 445/6 5438

F33615-81-C-3204
Northrop Corp., Hawthorne, CA. Aircraft Div.
AD-A118 768/1 5343

F33615-81-K-3017
Dayton Univ., OH. Research Inst.
AD-A118 720/2 5516

F49620-76-C-0105
Center for Information and Numerical Data Analysis and Synthesis, West Lafayette, IN.
AD-A118 801/0 5397

F49620-77-C-0011
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
AD-A118 482/9 5396

F49620-77-C-0037
Yale Univ., New Haven, CT. Dept. of Computer Science.
AD-A118 562/8 5440

F49620-77-C-0039
SRI International, Menlo Park, CA.
AD-A118 616/2 5495

F49620-77-C-0062
McDonnell Douglas Research Labs., St. Louis, MO.
AD-A118 473/8 5516

F49620-78-C-0060
University of Southern California, Los Angeles. Dept. of Aerospace Engineering.
AD-A118 665/9 5497

F49620-79-C-0189
National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
N82-29266/5 5498

F49620-80-C-0064
SRI International, Menlo Park, CA.
AD-A118 586/7 5396

F49620-80-C-0065
California Univ., Berkeley. Dept. of Mechanical Engineering.
AD-A118 576/8 5513

F49620-81-C-0015
Alphatech, Inc., Burlington, MA.
AD-A118 538/8 5465

F49620-81-C-0016
Mission Research Corp., Albuquerque, NM.
AD-A118 755/8 5501

F49620-81-C-0031
Rockwell International, Canoga Park, CA. Rocketdyne Div.
AD-A118 539/6 5495

F49620-81-C-0059
Southwest Research Inst., San Antonio, TX.
AD-A118 457/1 5359
AD-A118 458/9 5359

FC01-77ET10059
Exxon Research and Engineering Co., Florham Park, NJ.
DE82012444 5393

FC02-80CS30357
Syracuse Univ. Research Corp., NY. Energy Research Center.
DE82015488 5442

FG01-78ET12226
Colorado Univ. at Denver. Dept. of Civil and Urban Engineering.
DE82014499 5409

FG02-81R510288
Graham and Schlageter, Inc., Chicago, IL.
DE82015222 5458

FG03-80IR11125
Granzow Communications, Washington, DC.
DE82014697 5472

FG03-80SF11429
VTN Consolidated, Inc., Irvine, CA.
DE82008073 5393

FG03-80SF11442
San Bernardino Municipal Water Dept., CA.
DE82011825 5444

FG03-81CS22603
Institute for the Human Environment, San Francisco, CA.
DE82012416 5423

FG18-81FC10501
Geological Survey, University, AL.
DE82014287 5409

FG22-80PC30221
Texas A and M Research Foundation, College Station.
DE82013694 5409

FG44-80R410200
Alabama Dept. of Energy, Montgomery.
DE82014897 5410

FG46-79R610918
Arkansas Energy Office, Little Rock.
DE82013296 5442

FM07-81ID40035
J-U-B Engineers, Inc., Twin Falls, ID.
DE82014094 5427

H0366020
Bendix Corp., Baltimore, MD. Environmental and Process Instruments Div.
PB82-262460 5412

HCFA-18-97144
Washington Univ., Seattle. Dept. of Health Services.
PB82-264912 5382
PB82-264920 5382
PB82-264938 5382

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Booz-Allen and Hamilton, Inc., Cleveland, OH.
PB82-257205 5411

JPL-95617
TRW Technology Research Center, El Segundo, CA.
N82-30075/7 5500

JPL-955278
ARCO Solar, Inc., Chatsworth, CA.
N82-29723/5 5456

JPL-955322
Colorado State Univ., Fort Collins. Dept. of Physics.
N82-29355/6 5514

JPL-955734
California Univ., Davis. Dept. of Physics.
N82-29375/4 5398

JPL-955832
Henry Krumb School of Mines, New York. Aldridge Lab. of Applied Geophysics.
N82-29678/1 5406

JPL-955959
Washington Univ., St. Louis, MO. Center for the Space Sciences.
N82-29677/3 5406

JPL-956013
Ohio State Univ., Columbus. ElectroScience Lab.
N82-29512/2 5513

JPL-956046
Cornell Univ., Ithaca, NY. Dept. of Materials Science and Engineering.
N82-29724/3 5430

JPL-956123
Pennsylvania State Univ., University Park. Fuels and Combustion Lab.
N82-29376/2 5514

JPL-956157
TRW Technology Research Center, El Segundo, CA.
N82-30074/0 5500

JPL-956158
Bend Research, Inc., OR.
N82-29377/0 5394

MA-81-SAC-10047
ICF, Inc., Washington, DC.
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PB82-260407 5368

MA81-SAC-10060
Massachusetts Inst. of Tech., Cambridge.
PB82-262221 5447

MBO-PO-1028
Newman and Hermanson Co., Washington, DC.
AD-A118 602/2 5369

MDA903-81-C-0410
Spire Corp., Bedford, MA.
AD-A118 654/3 5496

MDA903-82-K-0058
Ohio State Univ. Research Foundation, Columbus.
AD-A118 474/6 5380

MIPR-FD2050-80-68046
Martin Marietta Aerospace, Denver, CO. Denver Div.

AD-A118 477/9 5438

MIPR-N62269/82/MP/00918

Army Materiel Development and Readiness Command, Adelphi, MD. Countermeasures/Counter-Countermeasures Office.
AD-A118 585/9 5473

MM1800913-2

National Research Council, Washington, DC. Committee to Evaluate Antarctic Marine Ecosystem Research.
PB82-263203 5403

N01-HV-2912

Jefferson Medical Coll., Philadelphia, PA.
PB82-262734 5388

N00014-75-C-0210

Lamont-Doherty Geological Observatory, Palisades, NY.
AD-A118 824/2 5405

N00014-75-C-0312

Beth Israel Medical Center, New York. Dept. of Pathology.
AD-A118 623/8 5380

N00014-75-C-0398

Langley Porter Neuropsychiatric Inst., San Francisco, CA.
AD-A118 651/9 5380

N00014-75-C-0455

Purdue Univ., Lafayette, IN. Dept. of Statistics.
AD-A118 501/6 5439

AD-A118 548/7 5439

N00014-75-C-1121

Cornell Univ., Ithaca, NY. Dept. of Geological Sciences.
AD-A118 793/9 5413

N00014-75-C-1183

Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
AD-A118 478/7 5471

N00014-76-C-0001

Center for Naval Analyses, Alexandria, VA. Naval Studies Group.
AD-A118 702/0 5470

AD-A118 703/8 5457

N00014-76-C-0207

Stanford Univ., CA. Inst. for Plasma Research.
AD-A118 805/1 5351

N00014-76-C-0277

Yale Univ., New Haven, CT. Dept. of Computer Science.
AD-A118 562/8 5440

N00014-76-C-0439

Wisconsin Univ.-Madison. Mathematics Research Center.
AD-A118 599/0 5440

N00014-76-C-0745

Illinois Univ. at Urbana-Champaign. Dept. of Chemistry.
AD-A118 772/3 5395

AD-A118 782/2 5397

N00014-76-C-1136

National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.
N82-30013/8 5345

N00014-77-C-0240

Chicago Univ., IL. James Franck Inst.
AD-A118 788/9 5397

AD-A118 789/7 5397

N00014-77-C-0387

Brown Univ., Providence, RI. Dept. of Chemistry.
AD-A118 467/0 5510

N00014-77-C-0532

Massachusetts Inst. of Tech., Cambridge. Lab. for Information and Decision Systems.
AD-A118 757/4 5441

N00014-78-C-0198

Amherst Coll., MA.
AD-A118 589/1 5412

N00014-78-C-0315

Rensselaer Polytechnic Inst., Troy, NY. Dept. of Materials Engineering.
AD-A118 837/4 5432

N00014-78-C-0517

Columbia Radiation Lab. New York.
AD-A118 624/6 5396

N00014-78-C-0670

Tracor Applied Sciences, Austin, TX.
AD-A118 470/4 5471

N00014-79-C-0121

North Carolina State Univ. at Raleigh. Dept. of Materials Engineering.
AD-A118 800/2 5496

N00014-79-C-0214

Portland State Univ., OR. Dept. of Psychology.
AD-A118 666/7 5440

AD-A118 667/5 5440

AD-A118 730/1 5377

N00014-79-C-0231

Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
AD-A118 840/8 5416

N00014-79-C-0586

Yale Univ., New Haven, CT.
AD-A118 815/0 5499

N00014-80-C-0048

Aeronautical Research Associates of Princeton, Inc., NJ.
AD-A118 466/2 5497

AD-A118 529/7 5497

N00014-80-C-0080

Wisconsin Univ.-Madison. Dept. of Entomology.
AD-A118 512/3 5383

N00014-80-C-0384

Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.
AD-A118 776/4 5456

N00014-80-C-0693

Motorola, Inc., Scottsdale, AZ.
AD-A118 550/3 5420

N00014-80-F-0031

National Bureau of Standards, Washington, DC.
PB82-258922 5438

N00014-81-C-0570

California Univ., Berkeley. Naval Biosciences Lab.
AD-A118 631/1 5379

N00014-81-C-2224

Science Applications, Inc., McLean, VA.
AD-A118 936/6 5357

N00014-81-K-0292

California Univ., Los Angeles. Dept. of Materials Science and Engineering.
AD-A118 553/7 5434

N00014-81-K-0297

Delaware Univ., Newark. Dept. of Civil Engineering.
AD-A118 496/9 5404

AD-A118 518/0 5404

N00014-81-K-0301

Maryland Univ., College Park. Dept. of Management and Statistics.
AD-A118 549/5 5439

N00014-82-C-0132

Assessment Systems Corp., St. Paul, MN.
AD-A118 822/6 5416

N00014-82-C-0135

International Resource Development, Inc., La Grange, IL.
AD-A118 649/3 5359

N00014-82-G-0017

Alberta Univ., Edmonton. Dept. of Chemistry.
AD-A118 689/9 5396

AD-A118 705/3 5396

AD-A118 706/1 5396

AD-A118 707/9 5396

AD-A118 708/7 5396

AD-A118 709/5 5396

AD-A118 710/3 5396

AD-A118 711/1 5396

AD-A118 712/9 5397

N00014-82-G-0071

Association Scientifique Culturelle et Educative de Bonas, Chateau de Bonas (France).
AD-A118 463/9 5405

N00019-79-C-0331

Stanford Univ., CA. Information Systems Lab.
AD-A118 554/5 5473

N00019-80-C-0483

Stanford Univ., CA. Information Systems Lab.
AD-A118 802/8 5473

N00019-81-C-0119

McDonnell Aircraft Co., St. Louis, MO.
AD-A118 590/9 5433

N00019-81-C-0321

Michigan State Univ., East Lansing. Div. of Engineering Research.
AD-A118 572/7 5474

N00024-79-C-6043

Pennsylvania State Univ., State College. Applied Research Lab.
AD-A118 819/2 5516

N00039-79-C-0150

Verian Associates, Inc., Beverly, MA. Beverly Div.
AD-A118 475/3 5414

N00123-77-C-0792

Courseware, Inc., San Diego, CA.
AD-A118 500/8 5371

AD-A118 769/9 5372

N00123-82-D-0149

VSE Corp., Oxnard, CA.
AD-A118 523/0 5441

N00167-80-M-4781

City Univ. of New York. Inst. of Marine and Atmospheric Sciences.
AD-A118 688/1 5404

N00189-81-D-0126

ARINC Research Corp., Annapolis, MD.
AD-A118 690/7 5457

AD-A118 771/5 5458

N60921-81-C-0302

Analytics, Inc., Bloomington, IN.
AD-A118 767/3 5466

N61339-78-C-0182

Logicon, Inc., San Diego, CA. Tactical and Training Systems Div.
AD-A118 750/9 5372

N61339-80-C-0095

Vreuls Research Corp., Thousand Oaks, CA.
AD-A118 504/0 5371

N66001-78-C-0198

Minnesota Univ., Minneapolis. Center for Interest Measurement Research.
AD-A118 785/5 5372

N66001-79-C-0225

Varian Associates, Inc., Beverly, MA. Beverly Div.
AD-A118 475/3 5414

NAG1-125

Missouri Univ.-Rolla. Dept. of Mechanical and Aerospace Engineering.
N82-29558/5 5519

NAG1-126

Massachusetts Inst. of Tech., Cambridge. Space Systems Lab.
N82-29344/0 5518

NAG1-174

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